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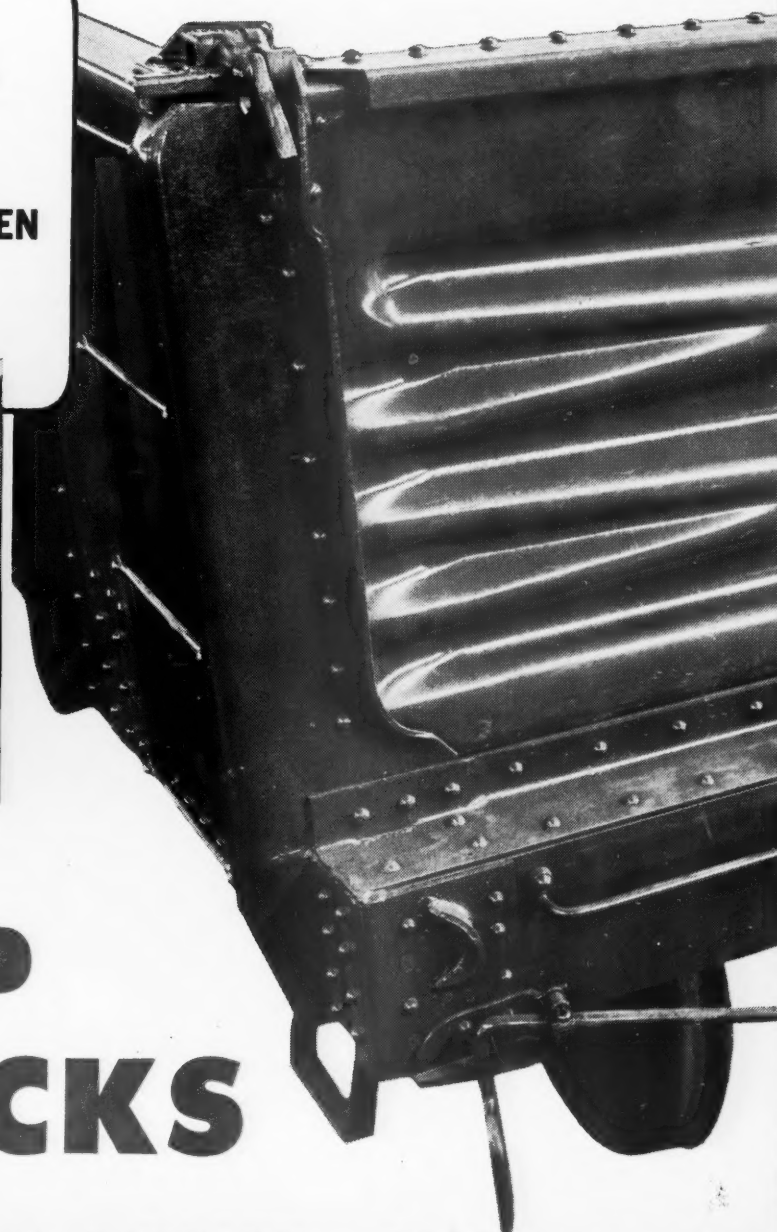
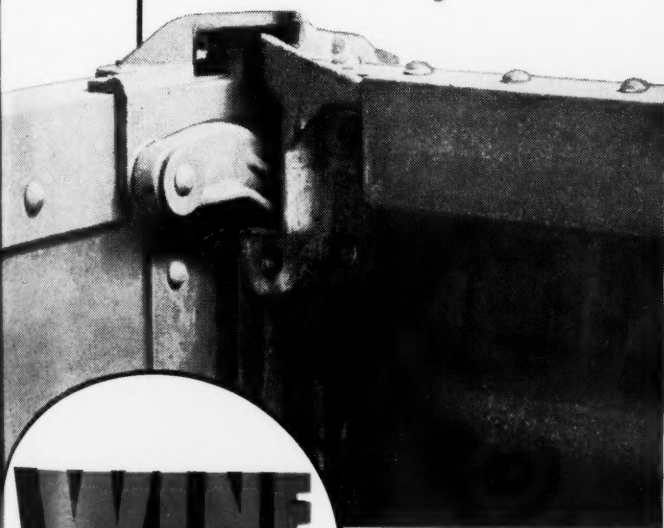
A.A.R. Mechanical and Purchases & Stores Division Proceedings

July 10, 1948

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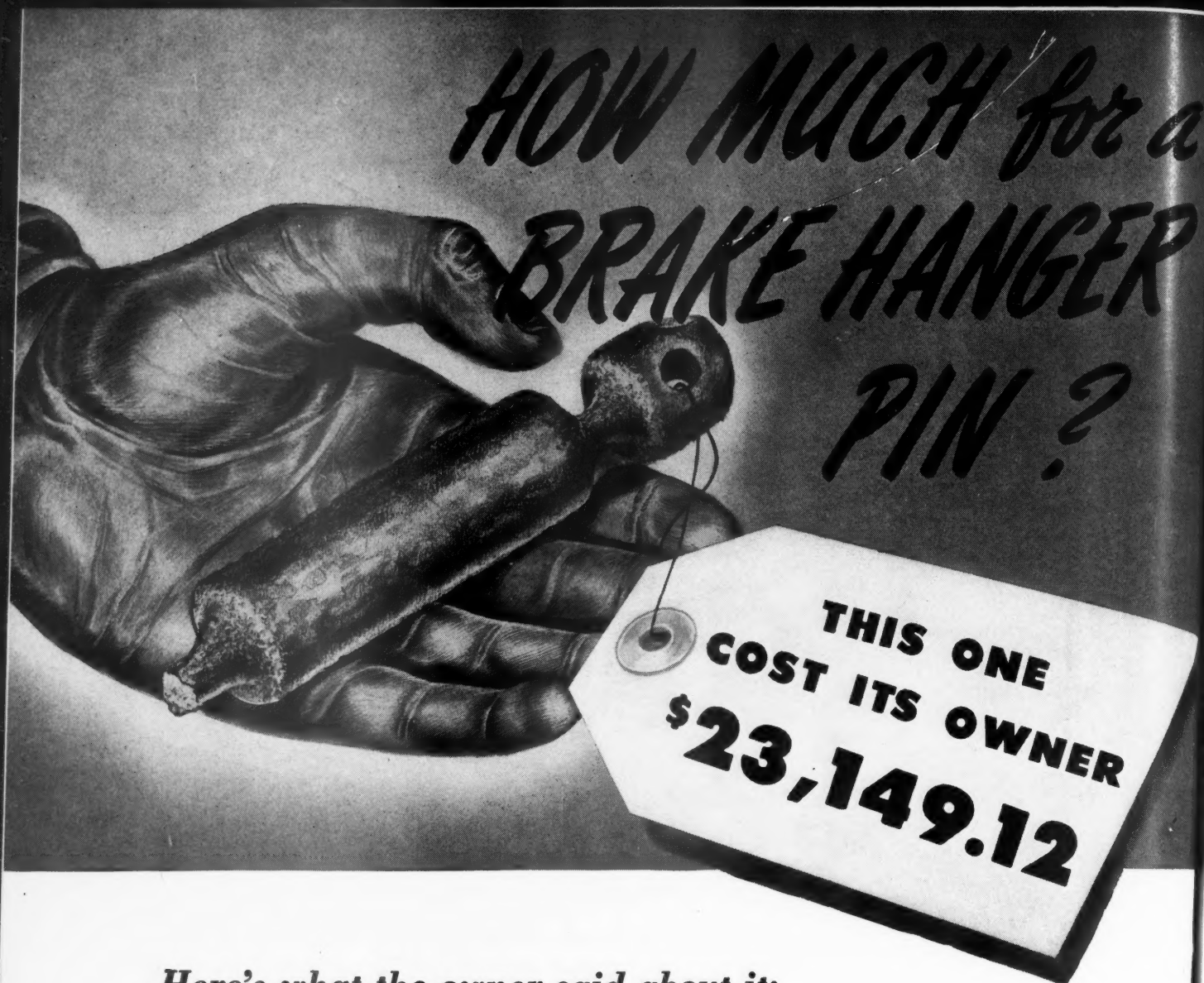
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WEEK AT A GLANCE

THREE CONVENTIONS: Comprehensive accounts appear in this issue of the proceedings of the conventions last week of three Association of American Railroads' divisions: Mechanical (page 78), Accounting (page 140) and Purchases and Stores (page 112)

ADDRESSES AND REPORTS: Those uninformed doubting Thomases who protest that the railroads are dead and don't know it, that they haven't made an improvement voluntarily, or accepted gracefully those allegedly forced upon them, since they put roofs on passenger cars to keep out the sparks, would have profited by attendance at any or all of these conventions, as our summaries of the committee reports and instructive addresses clearly demonstrate. Speakers included officers of the A.A.R., the Interstate Commerce Commission, major industries, and important and progressive railroads. The overtone of these messages was one of optimism and confidence, but they were not devoid of challenging revelations of opportunities open to the railroads to do a better job as producers of economical and efficient transportation.

WHENCE "VENTURE CAPITAL"?: The railroads' capital expenditures this year, somewhere around \$1.5 billion, have never been approached in previous years. Most of this sum comes either from reinvestment of the earnings of capital previously provided by investors or from depreciation charges. Some of it is "new money" which the country's "capitalists"—individuals, endowments, banks, investors of every category—are willing to risk in the railroad business. The risk is negligible, however, because the new money is going into that one form of railroad securities, i.e., equipment obligations, the value and marketability of which is almost independent of the railroads' credit standing and earning prospects. Where the risk is gaged by those considerations, though, their appraisal of it is such that no new money is forthcoming; in other words, no new railroad bonds or stocks are being bought. This situation—one that reflects conclusively the effect of political and economic policies that have strangled the railroads' ability to produce profits—is discussed dispassionately in this issue's leading editorial. The consequences of its persistence are obvious—and forbidding. An alternative source of "venture capital," still available under such conditions, is the public treasury, so generously employed for the support of the railroads' competitors. Use of this source is not advocated, but its existence need not be ignored.

MORE NET IN MAY: While the Class I roads' net income for this year's first five months, according to A.A.R. estimates, was \$15 million less than for the same 1947 period, May's results were better than last year to the extent of around \$14.7 million. Details appear in the news pages this week. With this turn for the better in revenue reports the railroads can see some prospect of being able to pay for more improvements and equipment out of current income rather than depending so largely on re-

serves accumulated during the war—reserves that the Department of Justice is doing its best to deplete through claims for major reparations, based on the assumption (still prevalent, apparently, in some Washington bureaus) that it is constitutionally sinful for a railroad to make a profit.

FAITH IN THE FUTURE: In planning and building its new merchandise pier at Norfolk the Norfolk & Western has expressed to the extent of \$6 million its confidence in this country's continued growth and industrial expansion. The illustrated description in this issue (page 136) explains the arrangement of this major tidewater terminal and outlines some of the techniques of construction and operation.

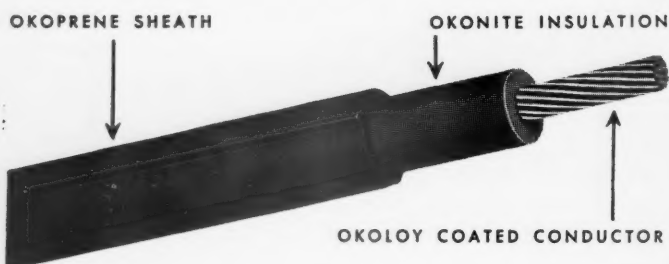
RATE OF SPENDING MAINTAINED: In the first four months of 1948 the railroads spent for materials and supplies and earmarked for new rolling stock more than a billion dollars. The details appear in the article on page 110. This is big money even in postwar dollars, and a contribution to the nation's economic health that rate-fixers, policy-makers, customers, employees, and the purveyors and producers of things the railroads use all have every reason to keep in mind as the industry's earnings and expenses are analyzed from month to month.

JUNE A 10,000-CAR MONTH: For the first time since the steel makers and the car builders got together on a program designed to result in delivery to the railroads of 10,000 new freight cars each month, that goal has been reached. June output, our news pages indicate, was 10,387 cars. But the Car Institute's President Felton and O.D.T. Director Johnson warn that this achievement was only a flash in the pan, as steel supplies haven't been coming along regularly enough for such output to be maintained. "Drastic curtailment" is expected by Colonel Johnson, who rates the results of the past year as 88 per cent of par. And while cars in service are being repaired at better than 25,000 a month the number awaiting repair is increasing.

GOSPEL FROM GOLDSBOROUGH: It's all right for the hold-out op brothers' bosses to say they have some rights, says Justice Goldsborough, but those rights don't permit them to go so far as to take steps (i.e., halt the operation of the railroads) "which will disintegrate society itself." Their threatened nationwide railroad strike, said this patient and practical jurist, would impose upon the public difficulties and sufferings which it "is not required to tolerate." Despite the best efforts of their lawyers to drag the Norris-LaGuardia Act and Secretary Royall into the fray on their side, a permanent anti-strike injunction was the outcome of their trip to court, as our news columns report. With Congress away, the three chiefs were back at the White House this week to see what kind of settlement they could bail out of their fading hopes of getting more than all the other unions.

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RAILWAY AGE

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"FEDERAL AID" FOR THE RAILROADS?

The railroads are this year making capital investments at the annual rate of about \$1.5 billion, exceeding by 50 per cent the highest rate ever attained heretofore (i.e., \$1 billion in 1923)—but most of the increased expenditure is going for new equipment rather than for improvements to fixed property. There has been since 1930 a persistent shortage of investment capital with which to enlarge and improve railroad fixed plant in ratio to the country's growth in population and production. Spokesmen for other industry are complaining, truly enough, that they do not have the inflow of new capital, especially "venture capital," needed to increase plant and production at the historic rate of growth. But the manufacturing industry earned 17 per cent on its net worth in 1947, while the railroads earned only 3.6 per cent. Industrial stocks are selling at an average of around 190 on the Dow-Jones index and railroad stocks are selling at 63. Whatever difficulties the manufacturing industry is experiencing in getting new capital are, obviously, inconsequential in comparison with the handicaps the railroads are encountering.

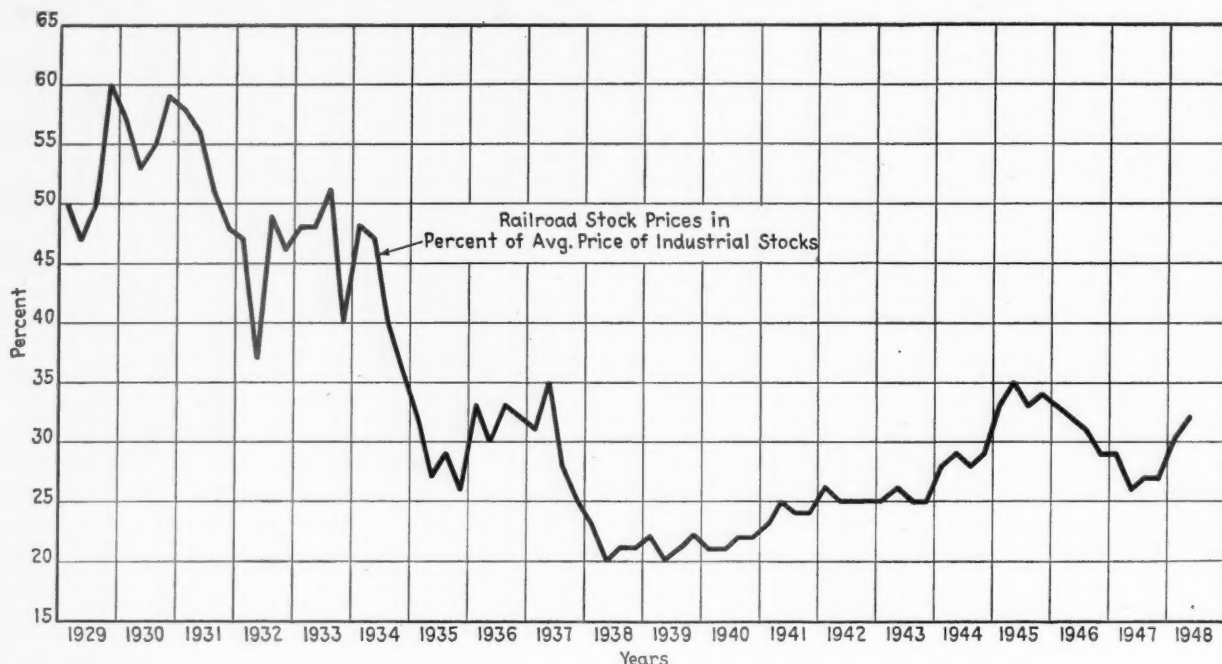
The railroads—viewed from the standpoint of what they do rather than from that of who owns them—are not an industry separate from manufacturing, mining and agriculture. They are, rather, the principal part of the inter-plant trans-

portation facilities of all other industry. The denial of means to the railroads to maintain the same rate of progress in plant improvement as that in the rest of industry served by the railroads will, in the long run, be just as costly to industry and the consuming public as if this dearth of capital improvement were occurring in industry itself.

How Betterments Are Paid For

There is no serious lack of capital for necessary additions and improvements to the railroad's motive power and rolling stock—because these are preferred investments. Only the "down payment" of 10 or 20 per cent represents "venture capital." The present shortage of railway rolling stock is not due to lack of funds but to lack of steel. It is quite a different story when it comes to securing funds for improvements and additions to the fixed properties—e.g., new buildings, new machinery, and reducing grades and curvature. The railroads cannot issue such risk-proof securities as equipment trust certificates for improvements to their fixed property. For these betterments, the only sources of funds are reinvested earnings or the sale of stocks and bonds. Few railroads could sell stock today and it has been a long time since any of them have

HOW THE RAILROADS COMPARE WITH INDUSTRY IN THE ESTIMATION OF INVESTORS



Computed on quarterly highs of the Dow-Jones averages

had the courage to try to sell bonds, except for refinancing. As a practical matter, therefore, the only funds available to the railroads for plant improvements are reinvested earnings. An industry which earns only 3.6 per cent on its net worth does not have much in the way of earnings to reinvest, especially after making the "down payment" on unprecedentedly large purchases of rolling stock. Depreciation charges make funds available for some plant replacement but not, of course, for expansion; and, because of increased prices, charges to depreciation are adequate to replace only a part of worn-out property.

Back in the decade of the 1920's when new investment money was readily obtainable by the railroads, both for new equipment and fixed property improvements, the new investment was divided: 53 per cent for improvements to the fixed property and 47 per cent for new equipment. In the 1930's when there was little money, or incentive to invest it, such new investment as did occur maintained the same ratio as in the 1920's, i.e., 53 per cent in the fixed property and 47 per cent in equipment. These ratios, having persisted for two decades, have considerable claim to be considered "normal." In 1947, however, 66 per cent of capital expenditures went for equipment and only 34 per cent for fixed plant, and, for the six years 1941-46, only 40 per cent

of total capital expenditures went for improvements to roadway and structures. In 1948 the distortion to the detriment of the fixed properties promises to be still more pronounced. A few more years of this and the contrast between the railroads' fixed and moving property will be as bizarre as a man dressed in overalls, topped off with a boiled shirt and a dinner jacket.

The Basic Cause

One of the editors of this paper has written a monograph* in which is examined in some detail the extent of this shriveling away of capital supply for fixed improvements to railway plant. An effort is made to locate the source of the difficulty, i.e., not just in meager earnings, but in the causes for such earnings and why investors seem to have little confidence that this earnings situation gives any promise of being corrected. By process of elimination the author believes he has tracked down the basic cause for the unwillingness of investors to put additional funds in railroad fixed property in the huge and wholly unpredictable "investment" of government funds in highways, waterways and airways—with no de-

* The Need of the Railways for Additional Fixed-Plant Capital and Possible Means of Its Attainment, by J. G. Lyne. 170 Pages. Paper Bound. Published by Simmons-Boardman Publishing Corporation, 30 Church street, New York 7. Price \$2.50.

pendable ratio between these expenditures and charges, if any, levied upon the users of these facilities.

The chart reproduced here is taken from this monograph—and suggests just how much tougher a job confronts the railroads than the manufacturing industry in trying to stay privately financed. The author points out that it would be just as easy for the federal government to provide the railroads with funds for capital improvements to fixed property as it is to provide "federal aid" for highways, waterways and airports. The funds thus expended would not be a gift to the railroads but to railroad patrons, because, of course, the railroads would not be permitted to add sums so received to their property account. There is a precedent for such assistance from the federal government in the donations made for the elimination of grade crossings.

Nobody connected with this paper wants to see the railroads thus semi-socialized, but shippers by rail certainly have a right to demand either that the government quit giving "federal aid" to shippers who prefer highway and waterway transportation or else make equal aid available to shippers by rail.

It is just plain improvident for the federal government to finance highways and waterways in such a manner as to handicap the financing of additions and improvements to fixed property on the railroads—which are certainly the most vitally important part of the nation's transportation machine, economically as well as from the standpoint of national defense.

RESEARCH PROJECTS MULTIPLY

In the report of the General Committee read at the opening session of the annual meeting of the Mechanical Division of the Association of American Railroads, held in Chicago last week, reference was made to eleven research projects, some of which have been under way for several years and others of which are to be undertaken in the immediate future. They cover a wide range of subjects. Some have to do with specific problems of design, some with basic information concerning the engineering properties of materials, others with the development of data with which to improve the mechanical and economic performance of rolling stock, and at least one aims to develop fundamental information pertaining to the nature of the problem with which it is associated. In these projects at least six laboratories have participated or will participate, in addition to the contributions of various manufacturers

and of railroads in the service aspects of some of these studies. Several of these laboratories are the property of manufacturers. One belongs to a railroad and one to an engineering society.

In addressing the meeting, J. M. Nicholson, chairman of the division, listed the expenditures for research which had been made by the Mechanical Division in the eleven years beginning with 1938. In that year appropriations were made of \$62,500. In only one year since has the amount been less. It has grown until in 1948 appropriations were made for \$397,000. For the entire eleven years the total is \$1,377,500.

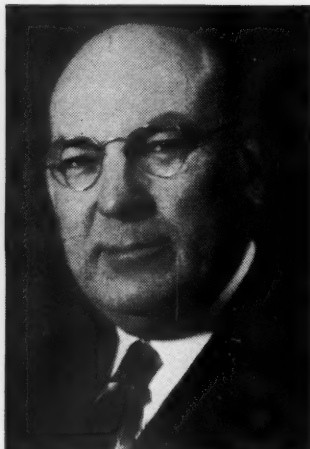
The pattern of the research activities revealed by the General Committee and by several of the technical committees in their reports is one in which each project is adapted to the circumstances surrounding the nature of that project, and the character and source of the facilities required for its prosecution. It represents an evolution and an accelerating rate of growth. While it may not satisfy those who would bring all scientific and engineering research pertaining to the railroads under a single head into one organization, it is meeting the growing need for basic facts with flexibility. Where problems cut across technical departmental lines, coordinating committees are employed.

New Laboratory Approved

That the Association of American Railroads anticipates a growth in the number of research projects it will sponsor may be inferred from the announcement of Vice-President Aydelott that the association expects to spend \$600,000 on a laboratory at the Illinois Institute of Technology at Chicago. These facilities will serve all departments of the railroads. They will not replace research facilities available elsewhere but will expand the range of opportunities and the volume of research work which can be undertaken to advance the art of railway transportation during the years ahead.

It must not be overlooked that this discussion pertains only to the research conducted by the railways themselves on an industry-wide basis. It does not embrace research projects undertaken by individual railroads nor those carried out by manufacturers of railway equipment, materials and supplies.

Some of the work in this category is of much wider application than to the railway industry alone, but much of it applies specifically to railway problems. The railways are service organizations which predominantly are buyers of the materials and facilities with which their business is conducted. Hence the volume of research from which they benefit is many times greater than that now conducted jointly by themselves or ever likely to be, even though that continues to expand rapidly.



OFFICERS

Left to right—J. M. Nicholson, chairman; V. R. Hawthorne, executive vice-chairman; A. K. Galloway, vice-chairman; A. C. Browning, secretary. Right below, J. R. Jackson, mechanical engineer



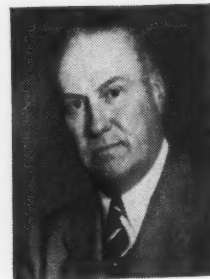
H. B. Bowen

A. A. R. MECHANICAL DIVISION

GENERAL COMMITTEE MEMBERS



Left to right—B. M. Brown, H. T. Cover, A. K. Galloway, John Gogerty, and J. E. Goodwin



Left to right—R. G. Henley, C. B. Hitch, A. G. Kann, F. K. Mitchell, and J. M. Nicholson

MECHANICAL MEETING OF VARIED INTEREST

Division research programs are expanding—An association laboratory to be built—Diesel wheels an unsolved problem

Eighteen technical committee reports, five of which dealt directly with research projects, were considered by the Mechanical Division of the Association of American Railroads during its twenty-second annual meeting held at the Congress Hotel, Chicago, June 28 to 30, inclusive. The program also included addresses by J. M. Nicholson, assistant to the vice-president of the Atchison, Topeka & Santa Fe, the chairman of the division; by W. J. Patterson, a member of the Interstate Commerce Commission; by J. H. Aydelott, vice-president, Operations and Maintenance Department, A.A.R., and by Dr. H. T. Heald, president of Illinois Institute of Technology. J. M. Hall, director of the I.C.C. Bureau of Locomotive Inspection, gave an informal talk on Tuesday morning. W. T. Faricy, A.A.R. president, was introduced and spoke briefly during the Wednesday morning session.

At the conclusion of the session Monday afternoon, Georges C. Bohl, chief of the French Railway Mission, Washington, D.C., presented a paper and motion picture illustrating vividly the progress which has been made to date in rehabilitating French railways from the widespread and highly destructive effects of World War II.

Mr. Patterson discussed the status of outstanding orders for the installation of various types of devices on railway cars and locomotives and announced that consideration was being given to an extension of time beyond the end of 1948 in which to complete equipping freight cars with the AB brake. Mr. Aydelott stressed particularly the importance of improvement of journal-bearing conditions to reduce hot boxes and referred also to the critical liquid fuel supply as it affects the railroads. He paused during his address to announce the approval by the board of directors of the A.A.R. of the building of a \$600,000 laboratory, which will be placed on the campus of the Illinois Institute of Technology at Chicago. Dr. Heald discussed the responsibility of industry generally and the railroads in particular in the matter of fostering the spread of technical education and the training of additional research workers.

During the meeting officers were elected to serve terms of two years. These were: Chairman, A. K. Galloway, general superintendent motive power of the Baltimore & Ohio, and, vice-chairman, J. E. Goodwin, chief mechanical officer of the Chicago & North Western. The retiring members of the General Committee were elected to succeed themselves for a two-year term expiring June, 1950. They are M. R. Brockman, assistant vice-president, Southern System; H. T. Covert, chief of motive power, Pennsylvania

System; R. G. Henley, general superintendent motive power, Norfolk & Western; C. B. Hitch, chief mechanical officer, Chesapeake & Ohio, and J. M. Nicholson, assistant to vice-president, Atchison, Topeka & Santa Fe.

Hall's Remarks on Safety

Mr. Hall reviewed some of the findings of the Bureau of Locomotive Inspection in its investigations of accidents and suggested some steps that could be taken to reduce the number of injuries and deaths sustained by employees. Those cases involving boiler explosions produced evidence, he said, that better instruction was needed in the action to be taken when low-water alarms operated, because they sounded so seldom that the crews did not know what to do when they heard the warning whistle. He believed that definite instructions should be issued giving permission to the engine crews to kill the fire when the water level was found to be low. Mr. Hall also thought that consideration should be given to the installation of quick-acting valves on water glasses in order that the pressure might be shut off quickly by crew members without being burned whenever a water glass broke.

In speaking of crankcase explosions in Diesel engines he said that the investigations showed that cover plates were being removed from hot engines too soon and the intruding air combined with the hot gases to cause the explosions. He mentioned that one railroad had gotten good results by issuing instructions that a half-hour wait must precede the removal of cover plates on hot engines. In conclusion he pointed out that old locomotives must be maintained in a safe condition regardless of the fact that railroads expected to replace them with Diesels within a short period of time.

Faricy Optimistic

Mr. Faricy, in a short informal talk, sounded an encouraging note as to the progress made by the railroads during the past year and the outlook for the future. While there is still no lack of troubles, particularly in getting enough steel to produce freight cars at the rate to meet the needs of the railways, he said that there was real hope for the attainment of the 10,000 freight-car-per-month goal during June. He also called attention to the fact that at the present time railways have more serviceable freight cars and passenger cars and better motive-power conditions than existed on Pearl Harbor Day. Earnings, he said, are definitely improving (the percentage

return has improved steadily for the past three years), the railroads received a good break from Congress during the session that recently closed, and there is a growing appreciation on the part of the public of the essential character of the service rendered by the railroads and of some of their problems in meeting the demands of the public. The railroads have not broken down, he said, and they are not going to.

ADDRESS BY CHAIRMAN NICHOLSON



J. M. Nicholson

Almost three years have now elapsed since V-J Day and we find economic conditions in this country far from being settled. Transportation agencies in general, and the railroads in particular, are trying desperately to re-establish themselves on a substantial economic basis, and at the same time maintain a state of preparedness for any eventuality.

The part which railroad mechanical department officers and employees must take in these readjustments is an important one. Its importance stems chiefly from the fact that mechanical departments are generally the largest spenders of railroad funds. Maintenance-of-equipment expense on a representative railroad averages approximately 20 per cent of total operating expenses. Enginehouse expense, locomotive supplies and lubricants collectively represent approximately 3 per cent, making a total of 23 per cent of the total operating expense for which the mechanical department is definitely responsible. In addition to this responsibility, the mechanical department assumes a large share of the responsibility for reducing fuel costs, which alone amount to approximately 10 per cent of the total operating expense.

All together, it is fair to assume that the mechanical department is directly or indirectly responsible for about one-third of the total operating expenses of the average railroad.

What the Mechanical Division Does

The purpose of the A.A.R. Mechanical Division is to serve as a clearing house for mechanical department officers to assemble and disseminate information that will help them discharge their re-

sponsibilities more efficiently and enable the railroads to earn more by giving better service at minimum expense. It is hoped that the upward trend of material prices, taxes, and wage rates will soon be checked, but there seems to be little hope of any major reductions in the near future. Economies in railroad operation must, therefore, be obtained through the design, construction, and use of better equipment and the use of improved methods for getting things done.

We saw at Atlantic City last year a magnificent exhibit of better equipment and better tools with which to work. It is unfortunate that not all of our members were able to see these exhibits and study them for themselves. These exhibits represent the contributions of the equipment builders and railway supply men toward better and more economical railroad operation.

In addition to the development work represented in these exhibits, the association has been carrying on for a number of years an extensive program of research in certain fields which, in most cases, have been too large to be covered by the research organizations of individual member roads or manufacturers. The purpose of these research projects has been to attract more business to the railroads, improve railroad operations, and minimize railroad costs. The total amounts appropriated by the A.A.R. Mechanical Division for research projects during the eleven-year period 1938 through 1948 total \$1,377,500, as shown in the table.

A.A.R. Mechanical Division Research Appropriations	
1938	\$ 62,500
1939	52,000
1940	70,000
1941	145,000
1942	123,000
1943	93,500
1944	88,000
1945	112,500
1946	151,000
1947	183,000
1948	297,000
	\$1,377,500

Outstanding Research Projects

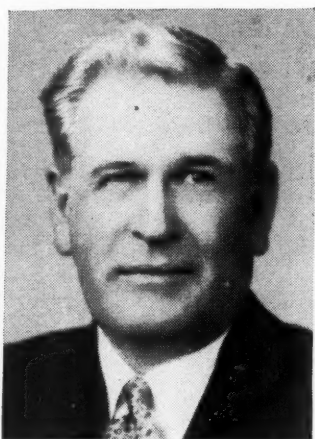
Some of the outstanding research projects of former years relate to air brakes for freight and passenger cars, also couplers and draft gears for cars and locomotives. [Mr. Nicholson here referred briefly to axle research which has been in progress since 1937; crank-pin and axle research, organized early in 1938, and to other projects which the Mechanical Division now has under way, including hot-box alarm devices, brake-beam design, air conditioning of railroad cars, car journal lubrication, journal-bearing development, geared hand brakes, journal-box lids, and refrigerator-car design.—EDITOR.]

Joint Research Activities

In addition to the above research program in which the Mechanical Division is chiefly interested, an extensive research program has been carried on for a number of years by a joint committee consisting of representatives of the Engineering and Mechanical Divisions. The attention of this joint committee has been devoted to the relations between track and equipment. The activities of this committee have

consisted largely of field tests of locomotive counterbalancing, impact effect of flat wheels, relation of wheel diameter to permissible wheel load, and intensity of lateral forces from locomotives with respect to track alinement.

All of the research projects mentioned have been carried on with the participation of the various interested committees of the Mechanical Division. In view of the wide scope of recent developments in railroad equipment, some of the committees have been reorganized and augmented in personnel so as to better enable them to cover the subjects assigned. Some of their reports will deal with research projects. Others will present information which has been collected from various sources or developed within the committees themselves. Our committees have worked diligently throughout the year and deserve credit for the manner in which their reports have been compiled.



COMMISSIONER PATTERSON ON SOME CURRENT SAFETY PROBLEMS

W. J. Patterson

It has been a pleasure for me to work with your General Committee in dealing with matters of common concern. I like your record in many respects, but am somewhat alarmed in others.

Under our order of September 21, 1945, in Docket No. 13528, the time within which freight cars are required to be equipped with AB brakes expires at the end of this calendar year. Although the investigation which resulted in the adoption of the order of September 21 was instituted in 1922 and the AB brake was made standard by this division in 1933, it is obvious that an extension of time beyond the end of this year will have to be made within which to equip some of the cars not now equipped.

Time Extension for AB-Brake Applications

The commission is now giving consideration to this matter. A notice to that effect has been circulated to interested carriers and your General Committee is now requested to give our notice as much publicity as necessary. The extension order may not be issued until we receive the report from you showing the

status of the several carriers as of June 30 this year. In the meantime, it is requested that individual railroads refrain from asking for relief.

The effective date of our order of January 16, 1946, requiring the application to road locomotives on or before June 1, 1948, of feedwater-tank indicators, auxiliary power-reverse-gear connections, and emergency brake-pipe valves, has been extended by order of April 27, 1948, to not later than when the locomotives receive Class 3 or heavier repairs. The locomotives subject to the order should, of course, be equipped as promptly as possible.

Boiler Explosions

Boiler explosions caused by overheated crown sheets are the most prolific source of locomotive accidents that result in deaths and permanent injuries. There are now in use devices for the purpose of avoiding or minimizing the effects of such crown-sheet failures. Among these are devices to improve the water circulation, low-water alarms, and soft plugs. Our records indicate that at least some of the enginemen have not been properly instructed with respect to the use and functions of these devices and that in some instances the crown sheets have not been fully protected by the devices that were installed.

It seems manifest that whatever device is installed to avoid these failures, the installation should be complete and adequate for the purpose and the men who are to work with it should be fully instructed with respect to its use and functions.

The Load Compensating Brake

At the present time the Association of American Railroads requires that all freight cars, except refrigerator cars, offered in interchange with single-capacity brakes shall have a nominal braking ratio of not less than 50 per cent nor more than 75 per cent of the empty car weight, based upon 50 lb. brake-cylinder pressure. The recommended practice calls for a minimum braking ratio for new freight cars of 18 per cent, preferably 20 per cent of the gross rail load, based upon 50 lb. brake-cylinder pressure.

This minimum braking ratio is entirely too low. The unequal braking, ranging from 18 to 75 per cent of the gross car weight, leads to destructive shocks and excessive slack action in long trains. The operation of heavier and longer trains at higher speeds obviously causes longer stopping distances, rougher handling of trains, and, under certain conditions, with minimum permissible braking ratio on the whole train it might result in control of a train being lost entirely.

What is thought to be a practical load-compensating brake for freight cars has been developed and is now in experimental service. Arrangements for road tests of this brake during the summer months are now being completed. If this brake is found satisfactory, it should promptly be made standard equipment and required to be used on all freight cars when necessary to secure a proper braking ratio for the loaded car.

Recent developments in material and design indicate the probability of a much needed improvement in freight-car brake beams and attachments. Train

accidents reported to the commission as a result of brake beams and associated parts rose from 279 during 1946 to 309 during 1947.

Hot Boxes, Axles, Wheels

As the length and speed of freight trains continues to increase, the detection of hot boxes by train and engine crews becomes more difficult and the consequences of journal failure more costly. The number of train accidents as a result of journals failing due to overheating as reported to the commission rose from 375 during 1946 to 421 during 1947. This indicates the need for further development of methods of hot-box detection and improved materials and practices in regard to journal-box lubrication.

The number of train accidents due to wheel and axle failures continues to increase. The annual average of such accidents for the five years 1940 to 1944, inclusive, was 1,314. During 1947 1,664 such accidents were reported.

With increased tonnage and speed, this problem will become more important. It is one which requires thorough consideration.

The number of train accidents reported to the commission as a result of draft-rigging failure also shows a marked increase. During the five years, 1940-1944, inclusive, the average annual number of train accidents reported due to this cause was 255. During 1947, 447 such accidents were reported. This increase indicates a need for prompt corrective measures.

Before closing, let me refer to the signal inspection act as it affects the Mechanical Division. Your president has found that the Mechanical Division, the Operating Division, and the Signal Division each has a vital interest in the operation of this law. There has, therefore, been created in the association a joint committee on train operation, control and signals upon which this division is represented. I am confidentially looking forward to the same cooperation from this committee that the commission has received from this division.

AYDELOTT DISCUSSES FUEL OIL

There is gratification over the increased number of new freight car units and new locomotive units which have been placed in service since the last session in Atlantic City. The number of new cars installed began to exceed retirements only last December. Freight car output, however, is not up to expectations and we are fearful that it may lag to some further extent in the third quarter, reflecting suspension of full scale operations by the steel mills due to the stoppage of coal production earlier in the year.

The demand for steel, while still unsatisfied, is perhaps a little nearer to production than it has been at any time since the war ended. However, there are ambitious programs under consideration for other elements in our economy, which, if adopted even in part, may make it more difficult as time goes

by to secure for the railroads the quantities of steel which they should and must have for their diverse uses and to make up past deficiencies. No one knows yet what the full effect of the European relief program will be on steel. Of further concern is the question of how much lumber will flow into that program. It is our purpose at association headquarters to keep as well informed as possible about these programs and should we believe any of them to be inimical to the interests of the rail carriers we shall take whatever action is indicated in an effort to keep the needs of the railroads for materials and supplies constantly to the forefront to prevent any ground being lost and to improve our situation if we can.

Research a Large Factor

The worth and influence of the Mechanical Division to the growth of our rail transportation systems to the present state of efficiency cannot be overstated. The unfortunate part about the whole matter is that the general public cannot appreciate all that has been done as to those details of design and construction which feature the rolling stock and the physical properties of our railroads today. Research has been a large factor. This activity as it concerns our rolling stock is nothing more than a trial and error determination of whether new designs and construction are better than the old and, if they appear better, to demonstrate their worth in exacting service tests.

Research must go on. Programs for each succeeding year seem to indicate more productive results and they are creating greater interest. Railroad managements are intensely interested in research as is witnessed by the approval of the expenditures of large amounts for such tests as this year involve freight trucks, refrigerator cars, journal bearings, air-brake equipment and the like.

Railway executives have made inquiries recently as to progress being made in studies and activities which seek the elimination or at least a marked lessening of the hot-box hazard. Some of these officers have gone so far as to suggest that the recommended specifications applying to journal packing should be made a condition for interchange requirements. I am sure that not all of this hot-box trouble stems from the lack of proper lubrication. Research activities which we are conducting in an effort to develop better-riding trucks; campaigns to secure a proper regard for specifications applying to wheel and axle construction and mounting, and better shop practices made possible by modern tools are expected to contribute to lessening the hot-box problem.



J. H. Aydelott

Not only must we find the remedy for overheated bearings because of the hazard which a burnt-off journal creates to the train itself and to other trains which may be passenger-carrying trains, but because our investment in the individual car today is so large that we can ill afford to have it and other cars destroyed and their contents scattered over the right-of-way as is a possibility when a journal failure occurs. Further, our car supply is not sufficiently adequate that we can continue to have these recurring losses.

Maintenance-of-way people believe that anything done toward improving the riding qualities of trucks under freight and passenger cars through better design and through the elimination of out-of-round and out-of-tram wheels and imperfect axles will lessen the wear and tear on track and structures, reduce maintenance costs and increase the life of the material involved. These are results the accomplishments of which constitute a formidable challenge to the mechanical division.

What About Fuel Oil?

You are all familiar with the growing consumption of petroleum products in this country and the problems of supply and distribution which have accompanied it. There is a national interest in the petroleum situation, particularly as to the adequacy of our national resources of oil to meet future needs both in time of peace and in time of war.

Consumption of petroleum products by the railroad industry involves almost every department. Mechanization of roadway and station operations and a growing use of motorized equipment for handling men and materials have aided the railroads in their efforts to overcome increased wage and material costs. The use of petroleum products has been distributed more widely over railroad lines since the Diesel locomotive came into widespread use. The grade of oil which these locomotives have been using is getting into a strongly competitive position arising from a growing demand for light oils for industrial uses and for the heating of homes and other buildings. Then there is the unknown demand that will arise from a greatly expanded air force which will include many jet-propelled planes known to be extravagant in the use of oil and of the grade with which we are most concerned.

The situation clearly calls for the closest possible cooperation between the railroads and the manufacturers of Diesel locomotives, since the industry will be under the necessity of continually seeking means of securing the greatest possible economy in the use of oil, particularly of the grade to which I refer.

Some experimental and perhaps some rather extensive use of a lower grade of oil than that heretofore used on Diesel locomotives has been made and it is hoped that the results obtained will indicate that a lower grade of oil may be used without lowering the efficiency or output of the locomotive.

Whatever may have prompted concern about the future adequacy of our national oil supply, one might readily find the answer in the huge output of commercial and private motor vehicles, approximating

5,000,000 units in 1947 with a goal exceeding that number in 1948. Additionally, automobiles and trucks of foreign manufacture are appearing on our markets and the use of planes is expanding now to include freight carriers whose fuel consumption is enormous for the load carried. Suspicion seems to have been voiced in some quarters that shortages of oil may be connected with the increased Dieselization of railroads but such a conclusion is not supported by reports which show the actual consumption of all fuel oil by locomotives as less in 1947 than in 1945. Consumption should further decrease if Diesel locomotives continue to supplant oil-burning steam locomotives, which seems to be the trend.

Russia and Its Railways

Since we hear so much about Russia, I think you will be interested in learning something about what that country is doing with respect to its railways. In 1946, the Soviet Union embarked on its fourth Five-Year Plan. An important part of that plan has to do with the rehabilitation and expansion of their system of railroads. From 1946 to 1950, Russia expects to spend 40 billion 100 million rubles, more than 2 billion 100 million American dollars, on its railroads.

Their equipment program provides for the acquisition of 6,165 long-distance steam locomotives, 555 electric locomotives, and 865 Diesel locomotives. The car program over the five-year period involves 472,500 new freight cars and about 6,000 new passenger coaches.

Russia attaches great importance to rail transportation for its industrial development, and it evidently has no intentions of permitting an inadequate railroad system to defeat its plans for industrial expansion.

American Standard World-Wide

Other than in the United States there are few railroads throughout the world that remain in private ownership and under private management. Those in the war-ravaged countries as with Russia face large expenditures for rehabilitation.

Throughout the world American standards of construction and our operating and maintenance practices are being copied. Today there are representatives from several foreign nations surveying American railroads in order that they may confer with our people and see first-hand the things which made it possible for our railroads during the recent war to produce so much transportation with facilities and equipment considered adequate only for normal peacetime requirements. They will find the answer in the determination of our railroad systems to keep their plants progressively modernized regardless of whether income was adequate or far below needs. They will find also there is no substitute for a competitive system which is a product of free enterprise without which our railroads could not attain and hold the position which they enjoy today in the world of transportation.

The people of this country expect their railroads to be ready for any emergency which might arise.

Yet, many things are being done that have the effect of weakening the railroad position.

All other forms of transportation have subsidies of one kind or another. It is quite possible, therefore, that the railroads in the necessity of meeting constantly rising costs of labor and materials have carried through a succession of offsetting rate increases only to find that they may have priced themselves out of the transportation market. We must, therefore, as railroad men, take advantage of every opportunity which presents itself to voice our situation before the public.

This nation can have a system of railroads which will cope with any future emergency only if it adopts and enforces constructive policies that will insure fair treatment of the railroads not only because they are an important element in our national economy but because in time of emergency they must attain peak capacity which they cannot do if peacetime earnings are inadequate to support expansion and modernization programs.

HEALD SPEAKS OF RESPONSIBILITY OF RAILROADS FOR EDUCATION

In an address at the Tuesday morning session, Dr. H. T. Heald, president of Illinois Institute of Technology, said the success the mechanical department officers have in achieving the goal of giving better service to the public will be determined largely by the ability of the railroads to attract and retain highly qualified engineers and research workers and to provide the kind of an environment in which they can produce the best results. Because the sources of such men are the colleges and universities, he observed that the railroads have an important stake in higher education in general and in engineering and scientific institutions in particular. Before making a specific proposal on what the railroads can do to help the schools and to make use of the aid the schools can give them, Dr. Heald reviewed the current college situation.

In 1947 the college enrollment soared to an all-time high of 2,300,000, more than half of whom were veterans. Although the peak of veterans' enrollment is expected to be reached before 1950, Dr. Heald said that if the long-term trends continue, college enrollment may well be maintained at a figure in excess of three million. The increased percentage of students taking engineering courses (above ten per cent today as compared with six per cent before the war) does not presage any surplus of engineers and scientists, in his opinion, because the percentage of these men in our employed population will continue to rise in our technological world.

Dr. Heald pointed out "the growing tendency to shift more of the responsibility for the support of college students—and indeed the universities themselves—to the federal government." He wondered if we were not taking the easy way. While certain types of research are a responsibility of the federal government, he said that "industrial research is

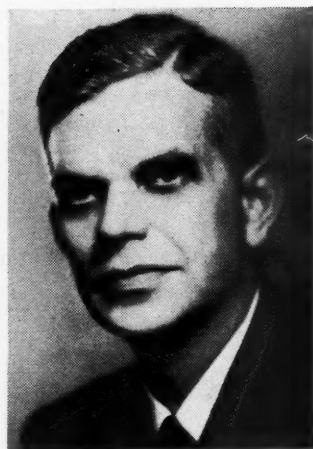
clearly a task for industry." Dr. Heald thought that central direction of the country's scientific investigation is a dangerous procedure; the alternative is greater support from industry, a responsibility that industry has accepted only on a small scale.

In recommending a course of action by the railroads Dr. Heald said, "They can place a greater emphasis upon and show a greater appreciation of research. Money, indeed, is important; but money does not automatically produce research results. The facilities, the proper organization, and the men to do the research are vitally important. I do not doubt that today among the nation's railway leaders we have a sufficient amount of thinking and talking for scientific and technological development, but thinking and talking will never do the job without tools, men, and tireless application. I think there are important opportunities for the railroads to improve their research programs through individual and joint action, with great profit to themselves and to the public.

"Again, the railroads can take more and more of their personnel from the colleges. The supply of college men will soon be more adequate, and the competition for these men then will not be nearly as great. However, if the railroads wish to obtain their share of the best of these men, they must offer opportunities, working conditions, and salaries comparable to those in other industries. Specialized courses in railway engineering are not needed to prepare men for the industry. The railroads need first-class graduates of the various modern engineering and scientific curricula.

Proposes Scholarship Program

"Perhaps the best way that the railroads can be certain that they will obtain a fair share of the better college men is to adopt the plan now used by a number of firms—to conduct a search for talent in our high schools and college and then encourage and give financial support to these promising young people while they are receiving their training. I should like to propose that the railroads jointly sponsor a nationwide competitive scholarship program to provide college scholarships for young men selected on the basis of their ability and capacity for scientific and engineering study. Such a program, properly developed, would stimulate interest in the industry and provide educational opportunities for excellent young people. A relatively small expenditure of money would have great public relations value. It might well accomplish more than much larger advertising expenditures. (Continued on page 144)



Dr. H. T. Heald

COMMITTEE REPORTS

OF THE MECHANICAL DIVISION

LOCOMOTIVE CONSTRUCTION

Emphasis on Diesel-electric parts standardization
— Gas-turbine locomotive progress reviewed



H. H. Lanning,
Chairman

The following items were submitted to letter ballot for adoption as recommended practices:

Separation of the drawings for piston-rod and piston head, in lieu of the present combination drawing, Plate 7, facing page 108 in Section F of the Manual.

Dimensions for three grooves and eight rings for piston valves to fit the majority of locomotives reported.

An alternate disk nut for all valves that provides more metal diametrically in the shoulder of the nut by increasing slightly the across-flats dimension and by changing from a hexagonal shape to a circle with four flats.

Steam Locomotives

[The committee listed 49 welded boiler shells built or on order and noted that the construction has progressed considerably since the first all-welded boiler was built in 1937 because of the trouble-free service being obtained from this type of construction as compared with the conventional riveted type boilers.—EDITOR]

Lateral Forces Exerted on Curves.—Under the direction of the Joint Committee on Relation Between Track and Equip-

ment, the Mechanical and Engineering Divisions of the A.A.R. have completed a field test of a Santa Fe passenger 4-8-4 locomotive near San Bernardino, Cal., to determine the intensity of forces exerted laterally on the rail of curved track under various arrangements of track resistances at comparatively low speeds. Since truck resistances have a considerable bearing on the relative stability and riding qualities of a locomotive, the engine was also tested on tangent track at high speeds with each arrangement of truck resistances studied.

The truck resistances used in this class of engine are 20 per cent initial and constant in the engine truck, and 15 per cent initial and constant in the trailer truck. For the purpose of studying the effect of various combinations of truck resistances, special castings were obtained by means of which the engine truck resistance could be set at 10, 20 and 30 per cent and the trailer resistance varied in the same values. With three resistances available in each truck there was, therefore, a possibility of nine different combinations.

In addition to Santa Fe No. 3784, two Union Pacific steam locomotives of the 800 class and one Southern Pacific 4400-class 4-8-4 types were submitted for single-day tests. These engines were not equipped with accelerometers so that no tests were made at high speed on tangent track, but since they differed somewhat from Santa Fe No. 3784 with respect to the truck resistances and lateral motion in the drivers, it was believed that the track records obtained would be of value to the study. Runs were also made on the test curve with Santa Fe 2-10-4 No. 5025.

The test of Santa Fe No. 3784 comprising track data from 5 to 30 m.p.h. and locomotive data from 5 to 100 m.p.h. is being analyzed to develop: (1) Effect of track resistances in all combinations on (a) forces against each rail, (b) movement of rail head, and (c) stresses in rail web fillets; (2) effect of engine speed under the above resistance conditions; (3) effect of variations in

front-driver lateral motion; and (4) riding qualities of the test locomotive under the same conditions of truck resistance with respect to high-frequency oscillations and low-order lateral movement of the engine bed with respect to the track.

The data obtained from tests of the U.P. and S.P. 4-8-4's and the Santa Fe 2-10-4 locomotives will be completely analyzed along the same lines except that no analysis can be made of the riding qualities as these engines were not equipped with the necessary instruments. The mass of data accumulated from records taken of Diesel and steam power operated over the test curve in regular service will be scanned and if there appear to be any unusual conditions radically different from those developed by the test locomotives, these will be completely analyzed.

Diesel Locomotives

In the 1947 report the results of a survey on Diesel-locomotive performance statistics were given in which the figures showed such wide variance that they had little or no significance. Because the reports were not on the same basis and all railroads do not follow identical procedure in reporting costs or calculating the costs per unit of service, it is questionable whether this or any survey can produce results which will be of value to the membership. Because of variation in operating conditions in the several sections of the country, it is doubtful whether statistics gathered on a nation-wide basis can be properly compared.

It is the recommendation of this committee, therefore, that this subject be dropped and the docket closed.

Standardization of Parts.—In the 1947 report a recommendation was made to adopt as Recommended Practice for Diesel Switching Locomotives of 600- to 1,000 hp.: (1) A standard axle 6½ in. by 12 in.; (2) two journal bearings for this axle; and (3) essential dimensions for an interchangeable truck.

These recommendations were made primarily as a test to determine whether there was a definite interest in the standardization of parts for Diesel locomotives. All of the recommendations were carried; item one without dissent, and items two and three by large majorities. The comments offered in connection with the negative votes were of considerable value to the committee

and some of them have been incorporated in the drawings to be printed in the Manual as editorial changes.

Some exception was taken to the inclusion of two styles of journal bearings. It was suggested that Style 1 which closely follows the general dimensions of the A.A.R. car journal bearing be retained, and Style 2 which covers a special bearing be eliminated. Style 2 was included because a large number of 600- and 1,000-hp. switching locomotives employing this bearing are now in service. The use of this bearing and the journal box adapted to contain this bearing do not affect the fundamental idea of an interchangeable truck for these locomotives. It was thought desirable, therefore, to show the Style 2 as an alternate. It was the hope of the committee that any newcomers into the field would adopt Style 1 as preferred.

The item of essential dimensions for an interchangeable truck was illustrated by a drawing which covers the trucks essentially used by three of the major builders of locomotives of this size and type. A truck frame either fabricated or cast could be built to these essential dimensions with the result that many details could be used, even though the traction motors, which are the only reason for differences, were not interchangeable.

The sketch shows the openings in the transom for the ventilation of the traction motors, as used by the three major producers of traction motors. A suggestion that a single opening with the largest area be shown has been incorporated in the sketch which encompasses all three of those originally shown, and requires only the use of an adapter plate to use any one of the three motors.

The other principal dimension which varies as between the three makes of traction motors concerns the motor nose-suspension lugs. A suggestion that the shortest lug only be shown so as to allow for the use of the largest motor was discarded in favor of providing the longest lugs for the shortest motors, and simply cutting off material for the largest motors. Thus a number of castings could be ordered for stock and readily adapted for any of the motors now generally in use.

The truck frame contemplated in last year's report makes it possible to standardize axles, wheels, journal boxes, bearings, and wedges, and for locomotives of equal size and weight, the semi-elliptic and coil springs. With standard location of brake-rigging lugs and brake-cylinder pads, brake rigging can be largely standardized. The committee has before it the details listed above with a view toward presenting them to the association as recommended practice to further the matter of standardization.

The Mechanical Division has no objection to providing a definite amount of water for fire protection if room for the necessary tanks and equipment

can be found. The direction of effort for the coming year will concern the possibility of finding a suitable substitute for the water acceptable to both the Mechanical and Fire Protection and Insurance divisions.

Diesel Locomotive Brake Shoes.—The committee's attention has been directed to the possibility of greatly reducing the stock of brake shoes required for Diesel road locomotives by compromise-radius brake shoes by using an unflanged shoe with an 18-in. back radius and compromise face radii for wheels from 36 to 42-in. diameters, or a similar shoe with a 20-in. back radius. If the compromise-face shoes are used, there is an advantage in the use of brake heads with a 20-in. face and shoes with 20-in. back radius, since the average wear is more uniform, and less scrap should result. Railroads using long shoes on high-speed trains will recognize these shoes are also usable on such cars.

Type Designations, Diesel and Electric.—Request has been received from a member road covering revision or clarification of Page F-103 of the Manual of Standard and Recommended Practices so as to make it more descriptive. In accordance with the recommended practice adopted in 1932, any locomotive, whether switch, passenger or freight, irrespective of capacity, if it has two four-wheel swivel trucks with two motors per truck is classified the same, namely B—B. This subject will be continued on the docket and either a more descriptive nomenclature be proposed or the present nomenclature suitably illustrated with diagrams to make it more understandable and more uniformly applied when used.

Attention has been directed to pages F-234 and F234-A which to date have not been revised in accordance with other sections of the Manual of Standard and Recommended Practices. It is recommended that the secretary make the following editorial changes on page F-234 in order to bring this sheet in conformance with the balance of the Manual:

Brake Shoes: No Change.

Rolled Steel Wheels: For the 44-ton Diesel-electric switching locomotives, A.A.R. Specification M-107-46, 33-in. rolled-steel wheels No. 33G, as shown on Page G-43 of the A.A.R. Manual of Standard and Recommended Practices; for the 600- to 1,000-hp. Diesel-electric locomotives, A.A.R. Specification M-107-46, 40-in. rolled-steel wheels No. 40A as shown on Page G-67—1946 of the Manual.

The Gas-Turbine Locomotive

The complete program for a coal-burning gas turbine, as presented by John I. Yellott in June, 1947, at the Mechanical Division Meeting in Atlantic City, and, as reported in the January 31, 1948, issue of *Railway Age*, is still substantially correct. The preliminary

engineering is being done on two locomotives, both being two-cab types.

The Baldwin Locomotive Works is constructing one oil-fired gas-turbine passenger locomotive for the Santa Fe.

The estimated cycle efficiency, using Bunker C fuel oil at full-speed rating, is 22 per cent. This locomotive, scheduled on the rails during 1949, is designed to maintain 3,000 rail hp. up to an altitude of 5,000 ft. and a temperature of 100 deg. F.

Westinghouse and G.E. Oil-Fired Turbines.—The Westinghouse Electric Corporation has designed an open-cycle, oil-fired gas turbine and this unit in March, 1948, had been tested at the South Philadelphia plant for more than 1,000 hr. The turbine power plant develops 2,000 shaft hp. with a thermal efficiency between 16 and 17 per cent at full-speed rating using No. 3 fuel oil or Bunker C fuel oil. Two units generally similar to the one under test are now under construction, and will be used to power a 4,000-hp. Westinghouse locomotive, which will be completed in about 18 months.

General Electric has designed an open-cycle, oil-fired gas-turbine power plant, and this unit in March, 1948, has been tested for 375 hr. under varying load conditions at Schenectady, N. Y. The power plant is 19 ft. long, weighs approximately 20,000 lb., and develops 4,800 shaft hp. when operating at full-speed rating.

The overall efficiency, burning Bunker C fuel oil, is approximately 17 per cent at the shaft after allowance is made for losses and power-plant auxiliaries. It is estimated that a gas-turbine locomotive with a power unit similar to the one being tested will be available in one or two years.

The members of the Committee on Locomotive Construction are: H. H. Lanning (chairman), mechanical engineer, A.T. & S.F. Steam and Electric Locomotives Section; E. L. Bachman (vice-chairman), general superintendent motive power, Pennsylvania; J. E. Ennis, engineering assistant, N.Y.C.; Frank Williams, chief mechanical engineer, C. N.; D. R. Calleri, mechanical engineer, S.P.; J. L. Ryan, mechanical engineer, St. L.-S.F. Diesel Locomotive Section; A. G. Hoppe (vice-chairman), general superintendent locomotive and car departments, C.M.St.P. & P.; K. Cartwright, chief mechanical engineer, N.Y.N.H. & H.; G. W. Bohannon, assistant chief mechanical officer, C. & N.W.; J. D. Loftis, chief motive power and equipment, A.C.L.; G. F. Wiles, supervisor Diesel-electric locomotive operation, B. & O. Gas Turbine Locomotive Section; H. C. Wyatt (vice-chairman), assistant general superintendent motive power, N. & W.; J. B. Blackburn, engineer motive power, C. & O. J. L. Carver, mechanical and research engineer, I.C.; E. P. Gangewere, superintendent motive power and rolling equipment, Reading; J. P. Ashby, Jr., assistant engineer Diesel and electric-locomotive design, U.P.

Discussion

Members, in discussing this report, said that there are several matters of vital importance to roads operating Diesel power: the question of brake shoes for road locomotives, lubricating oils, fuel oils and Diesel maintenance costs. The question of brake shoes resolved itself into specific recommendations that practices should be so set up that (1) a minimum amount of braking should be done; (2) the maintenance of truck brake rigging should be so controlled that brake shoes apply evenly on all wheels, and (3) the roads adopt a type of shoe that does not set up heat concentrations. It was suggested that these recommendations might contribute greatly to reductions in thermal cracking and wheel failures.

In the matter of lubricating oils for Diesel engines there seemed to be a leaning toward a demand for a "universal" crank-case oil specification.

With the increased demand and cost of Diesel fuel a member suggested that

the roads should recognize the possibility of a trend toward lower cetane rating and an increase in sulphur content. Such a trend might easily have a serious affect on engine performance and an increase in engine maintenance cost.

Another member, taking exception to the committee's recommendation that the study of Diesel costs be discontinued, emphasized the value of a general knowledge of Diesel operating costs in establishing operating policies. The chairman of the Diesel section of the report made the observation that the lack of cooperation of member roads in supplying the type of data that the committee felt desirable resulted only in mass of data of little tangible worth. The situation, being what it is, formed the basis of the recommendation to discontinue the study of Diesel-electric locomotive operating statistics.

The report was accepted and the recommendations submitted to letter ballot.

REPORT OF CRANK-PIN RESEARCH

Three progress reports on 20 different types of crank pins — Report on relief grooves and metallized pins

The Committee on Crank-Pin Research, organized in 1938, was given the assignment of investigating the fatigue strength of steam-locomotive main crank pins and developing data on which to improve the design of these parts with the objective of reducing service failures due to the development of progressive failures in the hub fit of the wheel center. Based on a survey of main-crank-pin failures on member roads conducted during the nine-months' period of November 15, 1937, through August 15, 1938, a laboratory research program was undertaken at the Canton Laboratory of the Timken Roller Bearing Company, utilizing the A.A.R. axle fatigue testing machines previously installed and used for testing full sized 5½-in. by 10-in. axles. To utilize this existing laboratory equipment for the crank-pin research program it was necessary to limit the size of the crank pin specimens to the capacity of the axle testing machines. Crank pins having a wheel hub fit of 9½-in. diameter were decided on and the crank-pin program has been carried along when the machines were available since 1942.

During the six-year period from 1942 to 1948, two progress reports have been made and the third is in preparation.

First Progress Report

This report, dated March 11, 1943, outlined investigations on four types of

crank pins as follows:

Design 1, (10 pins) was a straight cylindrical pin, and pressed into a wheel center having a straight cylindrical bore.

Design 2, (7 pins) was a pin identical to Design 1, except that the outer end of crank pin wheel seat was tapered .008 in. on the diameter for a distance inside the wheel fit of 1¼ in.

Design 3, (7 pins) was identical to Design 1, except that the wheel seat of the crank pin was cold rolled.

Design 4, (2 pins) was identical to Design 1, except that the wheel seat of the crank pin was flame-hardened.

The material of all pins reported in the first progress report was purchased to A.A.R. Spec. M-102-40, Grade 3, but the material was later found to conform to Specification M-104-37, Class A, normalized and tempered forgings.

Results indicated in the first progress report were to the effect that the endurance limit (on the basis of 300,000 mi. simulated operation) on the Design 1 pin was 10,500 lb. per sq. in. in the wheel fit. Incipient cracks were observed in all tests of this type with stresses as low as 7,000 lb. per sq. in. There was not sufficient test data to evaluate the other designs.

Second Progress Report

This report covers additional tests of the four crank-pin designs mentioned

above. From the combined data available in this report a percentage rating, based on its fatigue strength in the wheel fit, was assigned to each type of crank pin as follows:

	Per Cent
Type 1—Cylindrical, machined	100
Type 2—Tapered seat	136
Type 3—Rolled	more than 200
Type 4—Flame hardened	146 to 164

Considerable evidence indicated that fatigue cracks are initiated in the Type 1 pin at extremely low stresses and that the crack depth has a straight-line relation with the stress when plotted logarithmically. The endurance limit of this design was established as 11,000 lb. per sq. in.

Crack propagation characteristics in the Type 2 pin were very similar to those of the Type 1 pin. The endurance limit, however, was found to be 15,000 lb. per sq. in.

Type 3 pins did not break up to 22,000 lb. per sq. in., the highest stress at which they were tested. Cracks were initiated at the lowest test stress of 9,000 lb. per sq. in. It was evident that rolling the wheel seat surface materially retards the propagation, if not the initiation, of fatigue cracks.

Some difficulty was experienced with thermal cracks which appeared during the flame hardening of the Type 4 crank pin. In general, the deeper the case the higher the fatigue strength of the crank pin. Grinding after flame hardening appeared to have a beneficial effect.

The allowable fatigue strength after flame hardening and grinding appeared to lie between 16,000 and 18,000 lb. per sq. in. depending on the exact treatment.

Third Progress Report

This report, which is now in preparation, is expected to be available about August 1, 1948, and covers the results of investigations of 16 additional types of crank pins the characteristics of which are as follows:

Type 5—Quenched on O.D. & I.D., tempered at 1000 deg. F.

Type 6—Quenched, O.D. only, tempered at 1000 deg. F.

Type 7—Quenched, O.D. only, tempered at 750 deg. F.

Type 8—Quenched, O.D. & I.D., tempered at 500 deg. F.

Type 9—Quenched, O.D. only, tempered at 500 deg. F.

Type 10—Quenched, O.D. & I.D., tempered at 750 deg. F.

Type 11—One-inch relief groove half in, half outside wheel fit.

Type 12—Ground wheel fit, tapered 0.003 in. on diameter.

Type 13—Two-stage fit, inside half of wheel fit ¼ in. larger than outside half.

Type 14—Raised wheel seat, main parallel diameter ½ in. smaller than wheel seat.

Type 15—Wheel seat shot-peened.

Type 16—Wheel seat metallized with 1.20C wire.

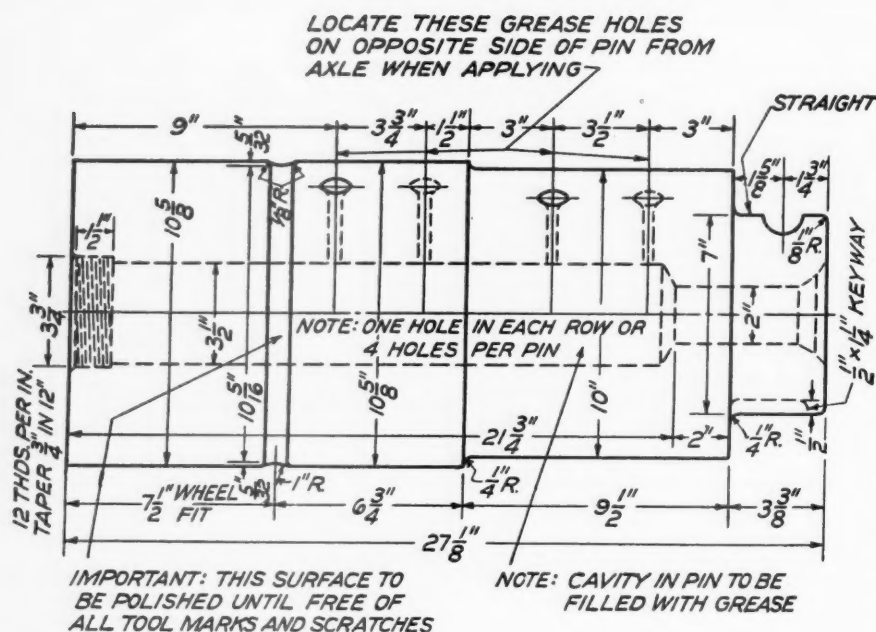
Type 17—Wheel seat shot peened and metallized with 1.20C wire.

Type 18—(Combination of Types 3 and 11). Rolled wheel seat and relief groove.

Type 19—(Combination of Types 3 and 10). Rolled wheel seat, quenched at 1,550 deg. F., tempered at 750 deg. F.

Type 20—(Combination of Types 3, 10, and 11). Rolled wheel seat, relief groove, quenched at 1,550 deg. F., tempered at 750 deg. F.

The last three crank-pin types mentioned above were added in an effort to combine desirable characteristics of some previous designs. The results of the investigation which were outlined



in the third progress report are as follows:

Limited test data indicated that there was no noticeable difference between O.D. and I.D. quenched compared to O.D. only quenched pins. Tempering at 500 degrees or 750 degrees gives far higher endurance limits than at 1,000 deg. F. The pins tempered at the lower temperatures showed fatigue resistance comparable to that shown by the rolled pin (Type 3). The 750 degree F. tempering is preferred because of the greater machinability of the resulting pin.

Types 11 (relief groove) and 14 (raised wheel seat) showed 45 per cent improvement in fatigue strength over Type 1. Types 12 (tapered) and 13 (two-stage fit) had a fatigue strength only 14 per cent or less higher than Type 1. Crank pin Type 15, not machined after peening, showed a 55 per cent increase in endurance limit over Type 1. Type 16, which was merely metallized, gave no evidence of improvement, whereas Type 17, which was shot peened and metallized had an endurance limit 64 per cent above that of the Type 1 pin.

None of the Type 18 (rolled and relief groove) pins broke in any tests up to the maximum stress of 22,000 lb. per sq. in. All pins, however, showed deeper fatigue cracks than corresponding Type 3 pins. Evidently some of the beneficial

residual stresses caught by rolling are relieved by the groove.

The test runs of Type 19 (rolled and heat treated) pins indicate that no increased benefit can be reaped from rolling the Type 10 pin. The crack depth was approximately the same as that of the unrolled pin.

Four tests on the Type 20 (rolled, relief groove, and heat treated) pin indicate that this design may have a higher resistance to fatigue cracking than any other pin investigated. This conclusion is based on the depth of fatigue cracks after completion of 300,000 equivalent miles at certain stresses compared to the values recorded for other

types of pins under the same conditions.

No tests were run at stress levels over 22,000 lb. per sq. in. because it was found impossible to keep the pin from pulling out of the wheel bore at those loads.

Road Service Experience

Information received from some member roads covering experience with main crank pins modified to take advantage of experimental data available as a result of a laboratory research program covers crank pins with relief grooves. For example, the Missouri Pacific reported as of January 17, 1948, on the extensive use of crank pins having machined and polished relief grooves.

Experimentation with the relief groove (Laboratory Type 11) on this railroad was started in 1941 and the practice was adopted as standard in September, 1945. A typical application to a main pin for heavy power is shown in Fig. 1, and the position of the groove with respect to hub fit is indicated in Fig. 2. It is the practice on this railroad to prestress the bore in the crank-pin hub before application of the crank pin by pressing through a plug as shown in Fig. 3.

Before the use of this type of pin and practice in application, cracks developed at a point just inside the wheel fit and the service life of main crank pins was limited to 150,000 miles. Since the use of the relief groove pin and prestressed hub bore the mileage limit was first increased to 300,000 miles. Later (when no cracks were found in most pins after the longer service period) the mileage limit was discontinued altogether and pins are now renewed on the basis of wear to a diameter 5/16 in. less than that shown on the drawing. One pin is

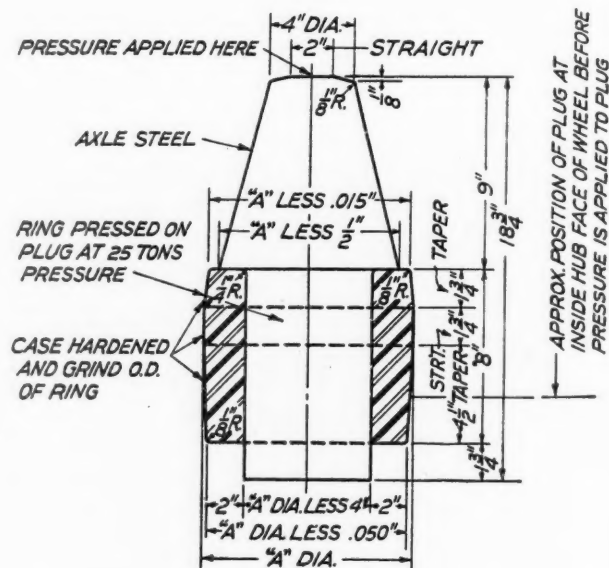
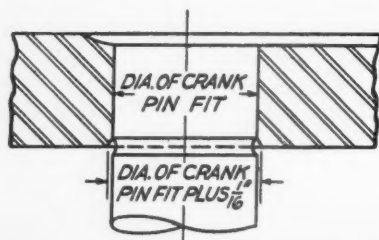


Fig. 3 (Right)—Bore pre-stressing plug

Fig. 2 (Left)—Diagram of pin fit showing location of relief groove

Dimension "A"=wheel bore plus .025 in. min. to .040 in. max.
Initial wheel bore to be $\frac{5}{16}$ in. under dia. as specified on wheel drg.
Example:—Drawing calls for 10 in. bore, initial bore equals $9\frac{3}{8}$ in.
Make plug $9\frac{3}{8}$ in. plus .025 in. minimum to plus .040 in. maximum
which will give finish bore 9.96875 in. + .025 in. = 9.99375 in. or
9.96875 in. + .040 in. = 10.00875 in. or approx. 10 in. as specified.

recorded to have traveled 563,000 miles before it was removed on account of wear.

Pennsylvania Metallized Crank Pins

A report furnished under date of January 14, 1948, by the Pennsylvania covering its service experience with metallized wheel-seat crank pins, states that experimental service installations were started in 1942 on six IIs freight locomotives (12 pins). Ten pins were later applied experimentally to K4s locomotives in high-speed passenger service.

The crank pins were prepared by machining the wheel seat to 1/16 in. less than the diameter of the wheel bore. The surface was then knurled and shot blasted before building up with 1.2 per cent carbon spraymetal wire until the pressed fit diameter was 1/16 in. larger than the wheel bore. The wheel fit area was then ground to the size required to obtain a 165- to 198-ton mounting pressure. Seven of the twelve pins on the IIs freight locomotives have been removed. None was cracked in the wheel fit. Five pins were still in service at the time of reporting and two of them had completed over 145,000 mi. of service.

All ten pins were removed from the class K4s passenger locomotives after the prescribed limit of about 125,000 miles. Five of the ten were cracked in the fillet, but none in the metallized wheel seat.

[The original report contained photographs of the spraymetal portion of a crank pin removed from a Pennsylvania Class IIs locomotive showing the lack of contact near the fillet on the opposite side of the crank pin from the keyway. The bearing areas of both pin and wheel were practically smooth on all metallized pin applications after removal. Other photographs showed the condition of the crank pin after removal.—EDITOR]

The railroad's conclusions, based on its experience with the preparation and application of the experimental groups of metallized main crank pins in freight and passenger service, as of January 14, 1948, was stated as:

1—All main crank pins with the metallized sleeve were found to be tight in the wheel center at the time of removal, requiring from 200 to 360 tons pressure to start the pins out.

2—All but two of the seventeen pins removed came out without damaging the metallized sleeve. A small piece of the metallized sleeve broke out at the keyway on two of the Class IIs pins.

3—There were no cracks found in the pressed fit portion of either the IIs or the K4s main crank pins when removed from the wheel centers.

4—The metallized sleeve provides protection against galling the pressed fit surface of the main crank pin, or the wheel center.

5—As the wheel-center pin holes are

not scored in applying or removing the pin, less material will have to be machined out in truing up the pin hole for another pin application, thus increasing the life of the wheel center, and reducing shop costs of crank-pin renewals.

No comparative tests were made with unprocessed pins of the same base material in parallel service, the application being made to note the condition of the pressed-fit surfaces and the reliability of the pins thus processed

with the metallized sleeve staying tight in actual road service.

The members of the Committee on Crank-Pin Research are J. R. Jackson (chairman), mechanical engineer, Mechanical Division, A.A.R.; K. Cartwright, chief mechanical engineer, N.Y. N.H. & H.; J. B. Blackburn, engineer motive power, C. & O.; E. L. Bachman, general superintendent motive power, Penn.; G. W. Bohannon, assistant-chief mechanical officer, C. & N.W.

The report was accepted.

REVISIONS OF INTERCHANGE RULES

Modifications recommended in 19 freight-car rules and four passenger rules—Restriction on extension dates in Rule 3 on couplers and truck frames is recommended



J. P. Morris,
Chairman

During the year Cases 1825 to 1828, inclusive, have been decided and copies forwarded to the members. A copy of these decisions is made part of this report.

The principal changes recommended in this report are:

Modifications are recommended in Rule 2 to provide for the handling of cars equipped with roller-bearings at interchange points [and to eliminate unnecessary clerical work in cases of load adjustment where the car was originally loaded in accordance with A.A.R. Loading Rules. Changes in Rules 3, 9, 17 (interpretation), 84, 85 and 93 were made to cover interchange of roller-bearings—Editor].

With the concurrence of the Committee on Couplers and Draft Gears and as announced in the 1947 annual report and in the current code, no extension beyond January 1, 1949, is recommended for the requirement in Rule 3 prohibiting acceptance from owners of cars equipped with couplers having 5-in. by 5-in. shanks.

No extension beyond January 1, 1949, is recommended for the requirement in Rule 3 prohibiting acceptance from owners of cars having truck side frames to which reinforcing plates or repair patches have been applied.

Extensions of the effective dates from January 1, 1949, to January 1, 1950, were recommended for the following items:

Section (b), Paragraph (7)—Brake levers; metal badge plates.

Section (b), Paragraph (9)—Braking powers; braking ratio.

Section (c), Paragraph (11)—Couplers having 5-in. by 7-in. shanks.

Section (c), Paragraph (12)—Couplers, bottom rotary operated, not equipped with assembled riveted-type lock-lift lever and toggle.

Section (t), Paragraph (10)—Tank cars; metal placard holders.

Section (u), Paragraph (4)—Class E-3 cars not to be accepted from owner.

With the concurrence of the Committee on Lubrication of Cars and Locomotives, it is recommended that new Paragraph (j-3) be added to Rule 3 to make mandatory the use of A.A.R. 1947 Standard journal-box lids on all cars built new or rebuilt on and after January 1, 1950.

With the concurrence of the Safety Appliance and Car Construction Committees, it is recommended that Note 1 following Paragraph (r-7) of Rule 3 be modified to provide for the use of lighter section metal dome steps and dome platforms where supports are centered not to exceed 48 in.

With the concurrence of the Committee on Car Construction, it is recommended that Paragraph (t-3-d) of Rule 3 be modified to require normalizing of secondhand truck side frames of T or L section designs, or U or any other section design cast in 1926 or prior thereto, to determine if same are suitable for reclamation or application to other cars.

Elimination of present Paragraph (w-2) of Rule 3 is proposed and it is recommended that provisions thereof be consolidated with present Paragraph (w-3), relocated as new Paragraph (w-2), and modified to prohibit double-plate cast-iron wheels and all cast-iron wheels below nominal weight in interchange and also to prohibit any type of cast-iron wheel without weight cast thereon.

Changes in Rules 70, 83 (to be eliminated), and 98 were recommended to bring their provisions in conformity with this change in Rule 3.

The brake-beam table under Rule 17 is revised to eliminate references to non-A.A.R. and former A.A.R. No. 1 brake beams, which are no longer acceptable in interchange.

Change in Rule 66 is proposed to reimburse the car owner for half the charge for the next journal-box repacking if account out-of-date, after a repacking line has failed to repack the boxes on cars with repacking date between nine and fourteen months old when wheel changes or other work has required the removal of packing from four or more journal boxes.

Addition of new Rule 66-A is recommended, to provide for the periodic lubrication of cars equipped with roller-bearing units.

New last note is recommended for addition to Paragraph (B-1) of Rule 112, to provide method of settlement for destroyed container cars and metal containers.

Changes in Rules 112 and 120 were recommended to include steel side and end doors, and metal drop end gates in the items of serviceable material returnable to the car owner if he so elects.

Changes to reduce clerical work in administrating the rules, to simplify billing; or to expedite handling bills for payment were recommended in Rules 5, 7 and 91.

Extensions of effective dates with respect to equipping all-steel and steel-underframe passenger cars with suitable receptacles for defect and joint-evidence cards, and covering the applications of brake-shoe spark shields to cars having wood parts exposed over the wheels from January 1, 1949, to January 1, 1950, are recommended in Passenger Car Rule 2.

New Paragraph (1-2) is recommended for addition to Passenger Car Rule 7, to provide for periodic lubrication of passenger cars equipped with roller-bearing units. Change in Rules 10 and 13 are recommended to conform.

It is also recommended that this rule make handling lines responsible for failure of roller-bearing units, or combination roller-bearing and friction-bearing units due to overheating when stenciling on the car indicates that periodic lubrication is 15 or more days over date.

The committee does not feel that any

of the modifications included in its report necessitate submission to letter ballot.

The members of the Committee on Arbitration are J. P. Morris (chairman), general mechanical assistant, A. T. & S. F.; J. A. Deppe (vice-chairman), superintendent car department, C. M. St.P. & P.; W. N. Messimer, superintendent of equipment, Merchants Despatch Transportation

Corporation; L. Richardson, mechanical consultant to vice-president operations, B. & M.; G. E. McCoy, assistant chief of car equipment, C. N.; C. I. Clugh, assistant chief of motive power (car), Pennsylvania; J. J. Root, vice-president, Union Tank Car Company; M. F. Covert, general superintendent equipment, General American Transportation Corporation.

The report was accepted.

BRAKES AND BRAKE EQUIPMENT

The Illinois Central places 400 lightweight coal cars with load-compensating brakes in interchange service



J. P. Lantelme,
Chairman

All reports on the cleaning of all cars still in service with experimental AB brakes have been received but a complete report has not been compiled.

Test of D-22 Control Valves.—From reports so far received indications are that the sub-committee will recommend consideration be given to extending the present 15-month air-brake cleaning period to 24 months.

Pipe Failures and Pipe Clamps.—In last year's report all committee members were requested to equip for test purposes a number of cars having AB brake equipment with a new style of threadless-flange pipe fitting known as Wabco seal in which the pipe is held in place with a rubber and metal fixture. Also, if possible, they were asked to equip some cars with welded forged pipe fittings to determine if these fittings would reduce the great number of broken pipes on AB brake equipment.

Twelve railroads have equipped 905 cars with Wabco seal fittings and three railroads have installed welded forged

pipe fittings on 1,266 cars. A circular letter will be sent to all members requesting that they report any failures of these fittings to the secretary of the Mechanical Division.

With the concurrence of the Committee on Car Construction, the committee recommends as a letter ballot item that: (a) The use of pipe clamps of the J-bolt type on all pipe, except retainer-valve pipes, be prohibited on new and rebuilt cars, and (b) The use of pipe clamps of the U-bolt type made of round iron on all pipe, except retainer valve pipes, and U-bolt at angle cock, unless such U-bolt pipe clamps have flattened contact surface with the pipe not less than the diameter of the bolt, be prohibited on new and rebuilt cars.

If approved, it is the intention that these restrictions will be incorporated under the heading "Pipe" on page E-12 of the Manual and recommendation advanced to the Arbitration Committee to make them a mandatory provision (after a future specified date) in Interchange Rule 3.

Use of Copper Bushings.—The committee has discussed with the manufacturers for some time the possibility of replacing the present non-metallic bushings in the main cylinders of the AB valves because these bushings become grooved, cracked, etc. After considerable tests by the manufacturers of various metals and non-metallic materials, it was found that a non-metallic material known as Durite was the most promising and has been used in over 450,000 AB service and emergency main cylinder bushings. This application was started over a year ago and to date no reports have been received of any difficulty.

A circular letter will be prepared calling attention to the use of this material, and requesting that if any difficulty is experienced the secretary should be notified.

Air-Brake and Signal Hose.—A joint sub-committee reviewed instructions in

the 1947 report and revised them with recommendations that the Replacement of Brake Pipe Hose (Other Than Armored Type) be inserted in the Code of Rules under Paragraph (j) of Passenger Car Rule 7. This item was included in the 1948 Code of Rules on Page 325.

The committee recommended as a letter-ballot item for adoption as standard practice "Instructions for Mounting New Brake Pipe Hose Other Than Armored Type". The instructions were included in the report.

Also, the committee recommends as a letter ballot item that page E-32 of the Manual be revised to include a paragraph, given in the report, on the testing, examination and replacement of reclaimed couplings.

Variable-Load Brake.—The committee quoted in full a proposed circular letter advising members of the variable-load brake and the cars equipped to date. Part of the proposed letter is as follows: "This is to advise you that the Illinois Central has now placed in interchange service 400 light-weight hoppers coal cars, Series 73600-73999, equipped with the new ABLC freight brake and automatic slack adjuster.

"A.A.R. Instruction Pamphlet No. 5039-4, Supplement #1, March 1948, entitled "Single Car Testing Device, Code of Tests", issued by the brake manufacturers and containing the AB brake test code now contains a new test code for testing the ABLC brake. Copies of this pamphlet may be obtained from the brake manufacturers.

"The following instructions are to be observed by member roads in servicing ABLC equipments:

"(1) The load-compensating brake must be single-car tested in the same manner as the single-capacity AB brake; also the compensating valve must be cleaned and tested on the AB rack at the same cleaning interval as is now required for the AB control valve. Suitable adaptor test plate is available.

"(2) Member roads operating cars with the ABLC brake may wish to consider stocking parts special to this equipment."

Air-Hose Gage.—Because of numerous complaints received in regard to the large number of brake-pipe hose couplings that pass the present no-go gage, which, after being placed in service are found to have excessive leakage due to worn lips and beads, the committee is investigating the necessity of using a more restrictive no-go gage to eliminate such couplings. All committee members were requested to check 1,000 couplings that have passed the present gage, after which these couplings will be gaged with two modified gages which will be .003 in. and .005 in. undersize, to determine what percentage of couplings will be rejected by each modified gage. After these tests are completed the committee hopes to be in a position to make recommenda-

tions as to what action should be taken.

Use of Rubber.—The committee investigated excessive brake-pipe leakage in freight trains, on complaint made by a number of railroads. The investigation showed that gaskets reclaimed during the war emergency and gaskets of synthetic materials caused most pipe-bracket leakage. Synthetic packing cups, such as Buna S, caused brake-cylinder leakage.

A circular letter has been issued to the members requesting that, at the next periodic air-brake cleaning or when any repairs are made, all control-valve and pipe bracket gaskets be carefully examined and those that were reclaimed or with flattened beads and made of Buna S material be scrapped. A circular letter will also recommend that all brake-cylinder packing cups for AB and U type cylinders be scrapped if made of Buna S materials.

Items Under Consideration.—In addition to the above, the following items are among those under consideration: Use of other than standard packing cups in the AB and U type of brake cylinders; reduction of weight in air-brake equipment; standardization of air-brake equipment on Diesel locomotives; location of brake pipe, straight-air and signal hose on front end of Diesel and steam locomotives; investigation of load-compensating brake, elimination of oil and moisture from air lines, particularly on Diesel locomotives; condemning gages for the shank of used hose couplings and nipples; excessive wear in AB valve release valve handles due to use of non-standard cutters; braking ratio for new and rebuilt freight cars, and size of air-brake pipe on passenger cars.

The members of the Committee on Brakes and Brake Equipment are J. P. Lantelme (chairman), general foreman, Pennsylvania; H. I. Trambie, (vice-chairman), air brake instructor, C. B. & Q.; R. J. Watters, general air-brake inspector, N.P.; R. E. Anderson, general air-brake inspector, C. & O.; R. N. Booker, general air-brake inspector, S.P.; W. D. Bowser, engineer air-brake and train-control design, U.P.; D. R. Collins, superintendent air brakes, D. & R.G.W.; F. T. McClure, supervisor air brakes, A.T. & S.F.; A. J. Pichetto, general air-brake engineer, I. C.; L. D. Hays, air-brake engineer, N.Y.C.; R. G. Webb, superintendent air brakes, C.M.St.P. & P.; C. C. Maynard, chief inspector air brakes, C.N.; J. Mattise, superintendent air equipment, C. & N.W.

Discussion

In respect to the use of non-metallic bushings one member expressed a preference for brass bushings and said that his railroad is applying brass bushings on equipment not offered in interchange.

Another member requested that consideration be given immediately to the extension of the present 15-month cleaning period to 24 months for D-22 control

valves because of the necessity for conserving man-hours and reducing car maintenance at this time. Referring to pipe clamps, he said that good results had been obtained by bolting air-brake pipes directly to the car underframe. He also felt that the Division should precede slowly before recommending any return to the use of brass bushings in the main cylinders of AB valves. This member indicated that his railroad had experienced no difficulty with the use of reclaimed rubber gaskets. In respect to the items under consideration as listed in the report he believed that the one dealing with oil and moisture in air lines of Diesel locomotives should be investigated at an early date because the presence of oil and moisture is a condition that creates a problem to those railroads operating in territories where the weather produces a high humidity.

A third member felt that the cleaning period for D-22 control valves should be extended to 36 months. He said that the precision methods used in the shops of his railroad produced a finish on valve surfaces that made the longer cleaning period desirable. In discussing pipe failures and pipe clamps this member said that the failures of threaded pipes had occurred ever since the railroads started operating. He told of the installation of butt-welded pipe in over 500 cars, the welds being made at all locations except at the end valves and at the retainer valves. He said that not one of the welded joints had broken or leaked since being placed in service and he recommended that the socket type weld fitting be made an alternate standard. This member also believed that both the J-type and the U-type bolt clamps should be discontinued because they do not do the job of keeping the air brake pipes rigid. He suggested that commercial clamps be employed because these clamps have been found to be satisfactory.

In commenting on the tests of the load compensating brake a representative of an air brake company said that these tests would be made on the Pennsylvania near Johnstown with Illinois-Central cars equipped with this brake because tests should be conducted on level track and on grades. He also mentioned that a better comparison with the AB brake tests made in 1933 could be made because this Pennsylvania territory was the location of those tests. He indicated that the test train will be longer than the 100 cars used in 1933 and believed that it may have as many as 150 cars. The test will be conducted under the supervision of R. G. Webb, superintendent air brakes, Chicago, Milwaukee, St. Paul & Pacific, who will represent the A.A.R. The tests will probably start about the 15th of July.

In answering the points raised by the discussers, Mr. Lantelme said that he believed that a twenty-four-month cleaning period for D-22 control valve should be recommended because the indications were that some of the equipment would not operate satisfactorily beyond

that time limit. He indicated that the data given in the report was not complete and that when the finished report was made he believed the members would understand why a longer cleaning period should not be recommended. In respect to the use of welded pipe fittings he pointed out that to his

knowledge there are no restrictions on the type of pipe fittings that can be used and believed that each railroad could select that type which it felt would do the best job.

The report was accepted and the recommendation submitted to letter ballot.

REPORT ON GEARED HAND BRAKES

Recommendations include the setting up of an average credit allowance and changes in welding regulations



A. K. Galloway,
Chairman

Up to the present time A.A.R. certificates of approval have been issued for 18 types of geared hand brakes—12 vertical-wheel types and 6 horizontal wheel types. These are listed in Interchange Rule 101. Brakes that incorporate changes which are not covered by the certificate of approval may not carry the symbol "AAR-1942" or be classified as an approved type until such time as the changes are approved by the committee and revised certificate of approval is issued. Prints of several revised brakes have been received and are being checked for addition to the record in the certificate of approval. All manufacturers have been canvassed as provided in the specifications to find out if the brake identifications are still correct.

Reclamation Repairs.—Specifications for general repairs and reclamation of geared hand brakes were adopted as standard as a result of Letter Ballot DV-1147. The committee has decided to modify Fig. 1, July 18, 1947, to show four views of the assembly of the rack proper on one sheet and make a new detail sheet, Fig. 2, for the attachments. On the attachment detail sheet each part is designated

by letter and number to indicate its use in tests of vertical, horizontal or lever type brakes. Complete sub-assembly drawings have also been prepared showing details of equipment for attachment to the rack for testing horizontal-wheel brakes, vertical wheel brakes and lever type brakes. In addition to the above drawings, photographs showing typical installations of each of the three types of brakes, with parts marked to check with the designations on detail sheets were included as a part of the report.

The committee has recommended that the Committee on Prices for Labor and Materials make studies of a sufficient number of repair operations to justify setting up an average credit allowance for defective geared hand brakes, thus eliminating the necessity for holding defective brakes and requesting disposition from car owner.

The committee has also been cooperating with the Committee on Prices for Labor and Materials regarding interpretation of specifications with respect to the reclamation of non-approved types of geared hand brakes, and also recommends that a provision be included in the Interchange Rules to protect the car owner against the application of non-approved types in place of approved types.

Welding of Geared Brakes.—The committee has recommended to the Car Construction Committee that the item with respect to geared hand brakes now in Interchange Rule 23, Section B, which is also proposed for inclusion in the fusion and bronze-welding regulations in the A.A.R. Manual, be modified as follows:

"Welding or brazing of mechanical parts of geared hand brakes is prohibited. However, worn holes or pads on front and rear housing plates may be built up by electric welding to provide proper seating for bushings or collars. Bushings may be tack welded to front or rear housing plates to prevent loss of or turning and wearing larger holes in either plate. Forge welding of the rod which extends from the bell

crank near the bottom of the car to the hand brake near the top of the car (or the hand brake connecting rod), is permissible."

This modification is to reconcile the wording of the interchange rule with the reclamation specifications, in order that standard welding regulations, the standard specifications for reclamation repairs to geared hand brakes, and Interchange Rule 23 will harmonize.

Uniform Hole Spacing.—A survey of the mounting-hole spacing on lever type brakes as supplied to the railroads developed that the present spacing of 7 in. horizontal and 11 in. vertical should be adopted as standard. The committee therefore recommends that a paragraph be added to the lever-brake section of the specifications for geared hand brakes to make the standardization, and that this item be submitted to letter ballot. Preliminary investigation indicates that the standardization of bolt-hole spacing for the horizontal type brake is impracticable due to the different combination of dimensions on the several types of horizontal-wheel brakes which have received A.A.R. certificate of approval.

Testing Device.—The adaptation of the test rack at Purdue University for testing lever type hand brakes has been completed and approved by the committee and all of the manufacturers of geared hand brakes were notified on November 11, 1947. Selection of brakes for tests will be made in accordance with Appendix A, Instructions Regarding Certificate of Approval of Geared Hand Brakes.

Pressed Steel Wheels.—The committee has approved a riveted construction for fastening the hub to a pressed-steel brake wheel. A welded construction for fastening the hub was also submitted but was not approved for the reason that welding is not permitted under I.C.C. Rules on Safety Appliances, and the committee has previously taken the position that welding of the type indicated will not be permitted.

The members of the Committee on Geared Hand Brakes are A. K. Galloway (chairman), general superintendent motive power and equipment, B. & O.; E. P. Moses, engineer rolling stock, N.Y.C.; J. P. Lantelme, general foreman, Pennsylvania. R. G. Webb, superintendent air brakes, C.M. St.P. & P.; J. R. Jackson, mechanical engineer, Mechanical Division, A.A.R.

Discussion

One member said that the differences in operation of the many types of geared hand brakes was responsible for injuries sustained by train crews. He said that many brakemen think they know how a certain hand brake operates but that in using the brake it frequently works differently than they expected and as a consequence they receive either minor injuries such as bruises or strains or major injuries because they lose their footing and fall to the ground. He suggested that the operation of the several

kinds of geared hand brakes be standardized to eliminate these accidents.

In reply Mr. Galloway said that the B. & O. has the hand-brake models located at its hump yards for the purpose of instruction new men in the operation of the brakes before they

start working in hump service. As a result this railroad has sustained very few injuries because of a lack of knowledge of the manner in which the geared hand brakes operate.

The report was accepted and the recommendation submitted to letter ballot.

JOURNAL BEARING DEVELOPMENT

Since the 1947 annual report the committee held one meeting with the solid bearing manufacturers' engineering representatives at the Indianapolis laboratory May 19, 1948. At this joint meeting means for the possible improvement in the design of solid type railway car journal bearings were discussed, along with a program contemplating the utilization of the recently completed research facilities available at the Indianapolis Laboratory.

Tests of V-Bearing Assemblies.—During the year the committee has received reports covering the removal of numbers of the original lot of 2,336 6-in. by 11-in. test bearing assemblies, and inspected lots of removed bearings assembled at the Indianapolis Laboratory.

Numbers of the test assemblies are still in service, but it is anticipated that final report covering service tests will be available in next year's report.

Journal-Bearing Marking.—The 1947 Annual Report included an item, concurred in by the committee on Specifications for Materials, recommending that the question of the restoration of the name of the purchasing railroad or car owner initials, pattern number, and serial number (optional) be submitted to the membership as a letter ballot item and, if approved, drawing in the D section of the Manual be changed accordingly. By action of the General Committee prior to presentation of the report, this item was deleted from the 1947 Annual Report.

At the February 19-20, 1948, meeting of the Committee on Specifications for Materials it was recommended that restoration of the prewar lot serial number (optional) be added to the A.A.R. standard journal-bearing design, shown on page D-24 of the Manual. This recommendation was passed on the premise that the lot serial number is of material assistance to the railroad inspectors in identifying rejected lots of bearings at the bearing manufacturers' plant. This recommendation was concurred in by the Committee on Journal-Bearing Development at its May 19, 1948, meeting.

It is recommended that the question

of the restoration of the lot serial number (optional) on the present standard A.A.R. journal bearing be submitted as a letter ballot item.

The members of the committee on

SPECIFICATIONS FOR MATERIALS

**Revisions in many detail specifications
—Emergency rubber provisions withdrawn—Firebox and boiler steel research**



H. G. Miller,
Chairman

[The committee recommended numerous revisions in material specifications and included with its report 18 exhibits covering proposed revisions in specifications for steel tires, spring steel, structural-steel shapes, steel sheets, and strip steel, galvanized sheets, hot-rolled carbon-steel bars, malleable-iron castings, air-brake, signal and various other kinds of hose.—EDITOR.]

In the committee's 1947 report, it was recommended that air brake hose gaskets be made of natural rubber and the emergency specifications withdrawn.

Journal-Bearing Development are J. R. Jackson (chairman), mechanical engineer, Mechanical Division, A.A.R.; L. B. Jones, engineer of tests, Pennsylvania; J. W. Hergenhan, assistant engineer, test department, N.Y.C.; J. L. Carver, mechanical and research engineer, I.C.; V. C. Barth, chief chemist, C. & N.W.

Discussion

One member mentioned difficulties being experienced with hot boxes due to broken bearings and loose linings and suggested that the committee give consideration to some practicable means of strengthening the bond between the lining and the brass bearing. Reference was also made to tests of cast-iron-back bearings on the D. L. & W. which are said to show interesting possibilities.

The report was accepted and recommendations submitted to letter ballot.

Similar action is now recommended to annul emergency specifications E-M-601-45, E-M-603-44, E-M-604-44, E-M-605-44 and E-M-606-44. New Specifications M-601, M-603, M-604, M-605, M-606, and M-608, are recommended for adoption by letter ballot. It is to be noted that M-605—Steam and Hot Water Hose has been corrected editorially and M-608—Pneumatic Hose is a new specification to separate air hose for 125 lb. per sq. in. working pressure from the welding gas hose which is designed for higher pressures.

The cooperative investigation mentioned in last year's report of your committee with respect to aging resistance of rubber compounds for air brake hose, etc., was further progressed during the past year and the tests are being continued.

Firebox and Boiler Steels.—As mentioned in last year's report, a research program has been undertaken under the general direction of the A.A.R. Mechanical Research Office, acting with a Subcommittee of the Specifications Committee and representatives of the American Iron and Steel Institute (A.I.S.I.) Technical Committee on Carbon Steel Plates, to determine the effect of residual alloys on carbon firebox and boiler steels.

Two conferences have been held since this group was organized. It was brought out in the first conference, held on February 11, 1947, that a program had been started by the A.I.S.I.

Technical Committee on Carbon Steel Plates to investigate the properties of a considerable number of run-of-the-mill specimens of boiler and firebox steels produced in the members' mills. This investigation was set up to include a complete chemical analysis of the steels tested, with particular reference to residual alloys, and physical tests to include investigation of the weld-ability and hot and cold flanging properties of the plates investigated. It was also decided to request member railroads to send samples of failed boiler and firebox plates to the Denver laboratory of the Denver & Rio Grande Western, for chemical and metallurgical investigation.

At the second conference, held on April 6, 1948, the A.I.S.I. representatives made available a preliminary report covering the chemical analysis and physical tests on a group of 145 production heat specimens representing ten plate manufacturers and consisting of rimmed, semi-killed, and killed types of carbon steels. In addition to the items covered in the specification requirements, check was made of copper, nickel, chromium, molybdenum, and tin for each of the 145 heats. The physical tests included tensile, Charpy impact, weld hardness, and precipitation hardening tests through a range of temperatures. The result of the hot working tests were incomplete, but the program is being continued.

A total of 31 failed specimens have been studied at the Denver laboratory.

These studies cover samples submitted by seven roads representing boiler plate failures, and six roads representing firebox plate failures. The majority of the failed plates investigated were carbon steel, but specimens of 2 percent nickel boiler plate and carbon-silicon and carbon-molybdenum firebox plates were included. The investigations conducted at the Denver laboratory included check for residual alloys and physical tests at room and elevated temperatures.

The studies of the effect of residual alloys on steels currently produced by the manufacturers and in failed plates submitted by member roads is being continued.

The members of the Committee on Specifications for materials are H. G. Miller (chairman), mechanical engineer, C.M.St.P. & P.; W. F. Collins, (vice-chairman), engineer of tests, N.Y.C.; T. D. Sedwick, engineer of tests, C.R.I.&P.; H. G. Burnham, engineer of tests, N.P.; H. P. Hass, director of tests and research, N.Y.N.H. & H.; L. B. Jones, engineer of tests, Pennsylvania; W. R. Hedeman, engineer of tests, B. & O.; E. B. Fields, engineer of tests, A.T. & S. F.; R. McBrien, engineer standards and research, D. & R.G.W.; R. H. Beverly, engineer of tests, Southern; G. E. Baumgardner, assistant research engineer, N. & W.; P. H. Smith, engineer of tests, C.B. & Q.

The report was accepted and the recommendations submitted to letter ballot.

ported approval for interchange service of 12 new designs of freight cars, involving a total of 1,209 cars, to be built for 12 car owners.—EDITOR.]

It was decided that prints and specifications for designs of new cars developed by various car builders, which vary to some extent from conventional designs but not to the extent they would be classified as "Untried Types" under Interchange Rule 3, should be submitted to the secretary for inclusion in his files as a matter of record.

In such cases it will not be necessary to submit approval applications to the committee, nor will the builder be required to obtain A.A.R. approval of the car design before starting construction, it being understood the car owner will be held responsible for compliance with Interchange Rule 3 with safety appliance requirements.

Each railroad should request car builders having orders for its cars which vary from, but are based on conventional designs, to submit one set of prints and specifications to the secretary for his file (who will notify the committee upon receipt thereof). Prints and specifications covering three lots of cars have been received and placed on file.

Loading Devices in Automobile Cars.—Early in 1946, the attention of the A.A.R. was forcibly directed to the increase in number of claims resulting from damage to automotive equipment loaded in special loader-equipped box cars due to failure of the auto-loader equipment. The automobile industry complained of the condition of the auto-loader equipment in cars offered to them as good-order equipment for shipment of their products, also, a number of personal injuries were reported as the result of faulty equipment. This condition brought about an increase in the number of inspectors required prior to loading and also necessitated removing defective cars from loading docks and transferring them to repair yards in the immediate vicinity. Consequently, an unusual load was placed upon the handling line and was out of proportion to the number of cars in the handling line ownership, largely because the other railroads, failed to make repairs to their own equipment.

As a result of these conditions W. C. Kendall, chairman, Car Service Division, A.A.R., brought this matter to the attention of the Car Construction Committee on July 3, 1946. The defects reported were analyzed and detail remedies were given in a circular letter dated August 14, 1946, prepared by the Car Construction Committee, and sent to the voting and associate members.

This subject was further discussed at a joint meeting of the A.M.A. Traffic Committee and Engineering Loading, Special Subcommittee of the A.A.R. Car Construction Committee, and Special Subcommittee of the Automobile Committee, Railroad Claim Section, with the result that a supplemental letter, dated February 3, 1947, containing

REPORT ON CAR CONSTRUCTION

Comprehensive consideration given to many details in this report covering various features of car design

Since 1936 your committee has, each year in its annual report, made a statement of the freight cars ordered during the preceding year. Sufficient detail is given in these statements to indicate the extent to which the members were following A.A.R. standardization for these cars.

[The report included three tables showing that, except for 4,025 50-ton hopper cars and 175 freight refrigerator cars of non-A.A.R. design, a total of 78,212 new house and hopper cars, ordered May 1, 1947, to April 30, 1948, were A.A.R. throughout, or conforming thereto, including lightweight alloy steel to A.A.R. base dimensions, floating center sills and inside dimensions to meet specific conditions. Of 115,184 gondola, flat, ballast, stock and special type cars, 112,066 or 97.29 per cent have A.A.R. standard 25¾-in. center-plate height; 118 or 0.10 per cent have 25⅝-in. center-plate height, and 3,000

or 2.61 per cent have 26¾-in. center plate height. The committee also re-



T. P. Irving,
Chairman

additional reported defects, was issued to circular letter dated August 14, 1946.

The conditions continued to remain critical in the loading field and progress in repairing loaders was slow. A third circular letter was, therefore, issued on February 12, 1948, which included a summary of the previous letters and some additional data. This circular letter was also sent out to voting and associate members and was widely distributed. As a result, there has been a considerable reduction in damage claims as well as a reduction in the number of complaints received from the loading points.

[This part of the report was submitted by Sub-Committee Chairman J. A. Gower. The report also included a discussion of refrigerator car door-sill steps, steel-sheathed box-car design, truck research program, gauge for measuring throw or run-out at the centers of axles, a sub-committee report on side frames and bolsters, service tests of helical truck springs, journal-box design and gauges for box-lid face and lugs, sub-committee report on brake beams, coupler maintenance, draft-key retainers, leeters for cars.—EDITOR]

Letter Ballot Items.—The following recommendations contained in this report are submitted for adoption by letter ballot of the members:

Revision of Sec. 6—Marking of Sec. M-202 and M-203 covering truck bolsters and truck side frames, respectively.

Adoption as recommended practice gage for measuring throw or run out at center of axle.

Adoption as shown on Plates B-32, B-33, B-34, and B-34A for journal boxes and lids.

Adoption as recommended practice journal box hinge lug and pin hole bushing for Class A, B, C, D, E, and F journal boxes as shown on Plate D-15A.

Adoption of new Item 19 under Fundamentals of Design (Manual page C-4).

Adoption of new and revised Manual plates C-28B, C-28C, C-28D and C-28F, covering draft key retainers.

Deletion from, modification of and additions to Sec. B of the Fusion Welding and Bronze Welding Limits and Regulations, appearing in Sec. L of the Manual, as follows: Elimination of items covering arch bars and tie bar, addition of item to cover welding of geared hand brakes, modification of item covering solid axles, addition of item to cover restriction on welding of metal running boards.

Adoption as standard arrangement and details of hold down clips for gondola cars as shown on Plate 803-A and revision of General Arrangement Plate 800-A covering 50-ton 41 ft. 6 in. light weight high side gondola car to show a similar arrangement of hold down clips.

Addition to and deletion from Recommended Practice "Classification of

Cars, Definitions and Designating Letters of," appearing in Section L of the manual, as follows: Adoption of new Designation "PBO" and definition for coach observation dome car; Elimination of designation "SPR" and definition for combination poultry and refrigerator car.

Revision of Recommended Practice for Placard Boards and Routing Card Boards as covered by Supplement to Manual Plates 246, 250, 1531-A to 1534-A, inclusive, and page C-42 of the Manual of Standard and Recommended Practice.

The members of the Committee on Car Construction are T. P. Irving (chairman), engineer car construction, C. & O.; J. A. Gower (vice-chairman), assistant mechanical engineer, Pennsylvania; R. B. Winship, mechanical engineer, C.P.; J. McMullen, consulting engineer, Erie; R. D. Bryan, mechanical assistant, A.T. & S. F.; R. H. Graff, assistant engineer rolling stock, N.Y.C.; W. A. Pownall, assistant to general superintendent motive power, Wabash; L. H. Kueck, assistant chief mechanical officer, Mo.Pac.; J. K. Peters, mechanical engineer, D. & R.G.W.; H. L. Holland, assistant mechanical engineer, B. & O.; L. R. Schuster, engineer car construction, S.P.; M. C. Haber, acting general mechanical engineer, U.P.; F. G. Moody, superintendent car department, N.P.

Discussion

This committee was said to have a greater responsibility than commonly realized and that railroads will "sink or swim," dependant largely upon what they do with car equipment, so said one

member, who called attention to the present cost of upwards of \$5,000 for a box car, as compared with \$1,000 or slightly more, 25 years ago, and he said that new Association of American Railroads rules and legislative action almost invariably increase costs. He suggested the urgent need for changes and improvement which will decrease costs.

With inadequate depreciation reserves, he asked where the money is coming from to purchase badly needed new car equipment. He referred to various details of freight-car design such as trucks, brake beams, running boards and hand-brake wheels and suggested that the committee give more consideration to entirely new designs which are forward looking, can be produced economically and are, in many instances, entirely outside present A. A. R. specifications. In reply, Chairman Irving stated that the committee will welcome and give due consideration to any new designs of car details which are submitted to it and promise to improve service or reduce costs.

Another member called attention to the difficulty in maintaining standard coupler and platform height and leveling cars on streamline passenger trains which operate as unit trains over more than one railroad. He said the handling line should be recompensed for the time and labor involved in adjusting side bearings and urged the respective committees to give prompt attention to this matter and, if possible, develop designs which are more easily adjustable.

The report was accepted and the recommendations submitted to letter ballot.

REPORT ON COUPLERS AND DRAFT GEARS

Tight-lock and standard coupler modifications, progress of Type F coupler, and draft-gear tests and classifications described

Improved Locklift Assemblies.—Improved type locklift assemblies, designated as H-15A and H-16A for Standard H. tight-lock couplers, and T-15A and T-16A for the Type T Modified tight-lock couplers, single and double operation, respectively, have been furnished in new couplers and for repairs to existing couplers since about a year ago to provide the greatest possible protection against undesired train partings. In August 1947 the Union Pacific applied these improved type locklift assemblies in the standard H couplers on two of "City of Los Angeles" trains, without the use of "S" hooks or other means to secure the couplers against accidental parting. While no formal report has yet been submitted by the U.

P., it is understood that they have functioned satisfactorily to date.

Intercoupling Tight-Lock with M.C.B. Couplers.—The reported difficulty in coupling standard H tight-lock couplers with M.C.B. couplers has been solved. Laboratory studies and service trials showed that the trouble could be corrected by a change in the contour of the pulling face of the M.C.B. knuckles. The standard coupler manufacturers have accordingly arranged to provide the required contour in M.C.B. knuckles furnished in the future.

Reclamation and Maintenance.—[During the past year the committee, in collaboration with the Mechanical Committee of the Standard Coupler Manu-

facturers, prepared Circular No. 5147, entitled "Instructions Governing Maintenance and Reclamation of A.A.R. Tight-Lock Couplers". These instructions, which appeared as an appendix to the report, were recommended for adoption as recommended practice and inclusion in the manual.—EDITOR]

Tight-Lock Coupler—Cradle and Carrier Design.—The design of a standard flexible carrier was referred to the Mechanical Committee of the Standard Coupler Manufacturers, and it was considered impracticable to recommend a single design. In view of this, a specification covering the fundamental requirements for a satisfactory flexible carrier for tight-lock couplers, was included as an appendix in this report and recommended for adoption as standard and included in the manual.

Standard H Tight-Lock Coupler Gage.—The Mechanical Committee of the Standard Coupler Manufacturers recommended two changes to the Standard H tight-lock coupler Inspector's Contour Gage No. 31727—an addition of 1/64 in. to the pulling face of the gage to allow for wear, and a 3/32 in. increase in the plus allowance on the "G" (guard arm) movable point of the gage to avoid excessive finishing. The changes were approved.

Articulated Rotor Lever Assembly.—As a result of satisfactory laboratory and service trials the Mechanical Committee of the Standard Coupler Manufacturers recommended adoption of an articulated rotor lever assembly for the Type E coupler, both for single or double operation, together with necessary manufacturing gages, as an alternate standard. The committee concurred in this recommendation, and standard catalog numbers will be assigned to both the single and double assemblies when adopted.

Uncoupling Mechanism.—The new coupler operating mechanism submitted by the Standard Railway Equipment Manufacturing Company last year was at that time approved for trial application limited to 125 car sets. Certain improvements were subsequently made and the former restriction has been removed with unlimited application to cars in interchange service now permitted.

To eliminate the necessity for two styles of rods, one for Grade B and another for high-tensile-steel couplers, the depth of the rotor lug in the two coupler designs will, in the future, be made the same, namely 5 1/8 in. from the bottom of the shank to the bottom of the rotor lug.

The pressed steel cap, with provision for welding, catalogue No. E2A was objected to by several railroads, and the following amended recommendation was made and approved by the committee:

TOP LOCK-LIFT HOLE CAPS

1.—That the new pressed-steel cap, catalogue No. E2A, be continued as

standard and be furnished in all new couplers on and after January 1, 1948.

2.—That the new pressed-steel cap, catalogue No. E2A, be furnished on all repair orders on and after January 1, 1948, except when the former standard malleable-iron cap, catalogue No. E2, is specified on orders by indicating both material and catalogue numbers.

Modification of Locklift Assemblies.—To adapt the present E8A (single) and E9A (double) rotary locklift levers for use with No. 6 type coupler operating mechanism, changes were made in the design of the rotor eye of both



H. W. Faus,
Chairman

levers, which will still permit use of the present standard one-piece operating rod but will provide the additional clearance necessary for the No. 6 rod. The new locklift assemblies incorporating these changes will be identified by catalogue No. E14A, single and E15A, double.

Rotary Operating Mechanism.—The required 4 in. minimum clearance dimension between the operating rod handle and the eye of the rod bracket in Fig. II, page C-34-D, Section C of the Manual, previously omitted, will be added as an editorial correction, as well as another change in Fig. II to indicate more clearly the required clearance between the inner end of the rod and the extension beneath the eye of the rotary locklift lever.

Standard Type E Engine Coupler.—As a permissible alternate practice, a proposed change in design of the coring in standard Type E engine coupler shanks, in order to reduce shrinkage frequently encountered in the vicinity of the pin hole, was approved, and pages C-43, 44 and 45 in the manual will be editorially revised accordingly.

Proposed Type F Interlocking Coupler.—The development of the Type F interlocking coupler and attachments is nearing completion and laboratory tests, in-

cluding complete physical tests and angling machine tests, have been conducted. Trial service applications have already been made to three Pennsylvania X40B cars, and additional applications on several other roads are being arranged. Coupling and angling trials made on the Pennsylvania cars in Altoona yards and on the hump were entirely satisfactory and no difficulty has been reported to date concerning the three cars in service.

High-Tensile Cast-Steel Yokes.—High-tensile-steel design Y-30 and Y-40 yokes were recommended to be submitted to letter ballot for approval as alternate standards.

Proposed Yoke Design.—The Waugh Equipment Company has recently submitted for A.A.R. approval a design of yoke for use with Twin-Cushion draft gear and E swivel shank coupler in freight cars having a standard 24 3/8-in. draft pocket. Comparative tests on this yoke in both Grade B and high-tensile steel indicated satisfactory strength in Grade B steel and this design was therefore unanimously approved and is recommended for adoption by letter ballot as an alternate standard.

Draft-Key Material.—Three railroads have each agreed to equip 25 cars with draft keys in the as-forged condition on one end and with keys hardened by quenching and tempering on the other end. Records of performance, including relative wear on keys and associated parts are being kept.

Specification References for Material.—Supplementing recommendations made last year, the committee recommended that the following additional material references be shown on drawings in the manual:

	A. A. R. Manual Page —	Specification No.
Coupler operating rods	C-34-D C-34-E C-76	M-122, Grade 1020 As-Forged
Striking casting or coupler carrier, C.S.	M-201, Grade B
Striking casting or coupler carrier, welded construction, plate steel	M-116, Grade B

Cracks in Coupler Side Walls.—The committee noted conflicts in the condemning and reclamation rules covering cracks in knuckle side walls of couplers and recommended changes as follows:

1.—Remove Fig. D. from Interchange Rule 18 and substitute therefor Fig. 9 of Rule 23, and change Paragraph (1-a) of Rule 18 to conform with the dimensions of the new figure.

2.—Remove Fig. 5, including the stenciling requirement, from Page C-70-1947 of the manual and substitute therefor Fig. 9 of Rule 23, and change paragraph 1 (e), Page C-66-1947, to conform.

3.—Change Passenger Car Rule 7, Paragraph (a), Interchange Rules, to read; (a) Such crack extends beyond the shaded area shown in Fig 9 of

Freight Car Rule 23. These cracks shall be measured on surface of coupler. Coupler bodies having cracks extending beyond these limits are condemned and must not be reclaimed by welding.

Coupler Vertical Spacing Limits.—The following paragraphs were proposed to be incorporated in the Interchange Rules effective August 1, 1948.

New Paragraph (g) to Rule 20—With coupler placed at proper height and in alignment, as prescribed in paragraphs (e) and (f), the vertical spacing between top of coupler shank and bottom of striking casting must not exceed $1\frac{1}{2}$ in. if necessary to make adjustment, the opening should be made $\frac{7}{8}$ in. or as near as practical thereto.

New Paragraph 13 to Section (c) of Rule 3—Couplers: Effective January 1, 1951, the vertical spacing between top of coupler shank and bottom of striking casting must not exceed $1\frac{1}{2}$ in.

As a further protection in the construction of new cars, it is recommended that reference to this spacing be included in the "Fundamentals of Design" and that a new Item 19 be inserted in both columns on page C-4 of the Manual of Standard and Recommended Practice, reading:-

Vertical spacing between top of coupler shank and bottom of striking casting (Maximum) $\frac{7}{8}$ in.

Supplemental Tests of Waugh Twin-Cushion Type UM 4-6.—The four gears which were applied to Armour stock cars ASEX 244 and ASEX 205 in 1940 and 1941, have not been removed for test since the last report.

The single gear which has been under constant compression in the Association laboratory since 1942 continues to be tested for capacity each month. To date neither the cushioning characteristics nor the capacity has changed appreciably. An additional specimen of this type of gear has been given a laboratory capacity test and then placed under constant compression in the open air. This gear is given protection from the weather only to the extent that a gear on a stored freight car would normally receive protection. It will not be disturbed for two years, at the end of which time the laboratory test will be repeated.

Tests of Gears After Service.—Arrangements are being made to obtain two specimens of each type of certified draft gear which has been in service for ten years and ship them to the A.A.R. laboratory to determine the condition of each gear after this amount of service.

Classification of Draft Gears.—The committee approved a decision to transfer to the obsolete class every gear which had a capacity of less than 15,000 ft. lb. when new, and a list of 16 draft gears was recommended to the Committee on prices for Labor and Materials for transfer from the non-improved to the obsolete classification.

Measurement of Draft-Gear Reaction.—Experiments being made by the Edgewater Steel Company with the cooperation of Purdue University at the A.A.R. laboratory in an effort to find a better and simpler method of measuring draft-gear reaction than by double differentiation of chronograph curves have been completed and results placed in the hands of the sub-committee. These will be studied and decision will then be made as to what use, if any, should be made of the findings.

The members of the Committee on Couplers and Draft Gears are H. W. Faus (chairman), engineer motive power, N.Y.C.; C. K. Steins (vice-chairman), mechanical engineer, Pennsylvania. F. T. James, chief motive power, D.L. & W.; N. T. Olsen, chief mechanical engineer, C. & N.W.; M. R.

Buck, engineer car construction, A.T. & S.F.; B. Faughnan, assistant works manager, Angus shops, C.P.; J. W. Hawthorne, superintendent motive power, C. of Ga.; I. N. Moseley, research and test engineer, N. & W.; H. N. Juel, engineer car maintenance, U.P.; A. B. Lawson, mechanical engineer, B. & O.

Discussion

In reply to a question about the specifications for flexible coupler carriers a committee member said that the specifications were purposely not narrowed down to the coil spring-type because there had not been enough experience with the semi-elliptic spring type to rule it out.

The report was accepted and the recommendations submitted to letter ballot.

NO NEW IDEAS FOR HOT-BOX ALARMS

Unsatisfactory operation of alarm devices under test prevents committee from recommending any such device

The first progress report, compiled by the committee and issued under date of April, 1947, giving a complete review of the work of the committee to that date, has been approved for distribution to the members (on request) at a cost of \$1.00. The report is also available to non-members at a cost of \$2.00.

During the past year a number of additional devices have been submitted to the committee from individuals and manufacturers, but there has been insufficient additional information developed since the 1947 annual report to warrant issuing a second progress report.

Tests on the Pennsylvania.—The principal activity of the committee during the past year was to continue observations of the four devices approved for road service tests, and installed in passenger cars equipped with solid bearings operating in regular service on the Pennsylvania. The four devices being observed in road service are: (1) Minneapolis-Honeywell Regulator Company's hot-journal alarm; (2) Union Switch & Signal Co.'s hot-journal detector; (3) Pennsylvania's cartridge type hot-box alarm, and (4) Magnus Metal Corporation's Twin-Plex smoke-and-odor bomb.

A tabulation showing the results of the road service tests of these devices as of March 1, 1947, was published in the 1947 annual report. The records for the total period of service as of March 31, 1948, show that the Minneapolis-Honeywell alarm in 27 months of service gave 11 true indications, 16 false alarms, two possible false indica-

tions, two failures and was found with 13 equipment defects, or conditions which might have prevented the device from operating properly. The Union Switch & Signal alarm in 28 months produced 4 true indications, 13 false alarms, one failure, and 11 defects. The Pennsylvania alarm in 22 months gave 8 true indications, 13 false alarms, one possible false indication, had one failure and 15 defects. The Magnus Twin-Plex alarm in 16 months gave no true indications, one false alarm, had one failure and one defect. A summary of the observations made of these four devices on the Pennsylvania from March 1, 1947, to March 31, 1948, were included in the report as Appendix A.

[Definitions of the terms were included in the report. A *true indication* is an instance where a hot-box developed and the device functioned properly. A *false alarm* is a case where the alarm sounded but no overheated bearing was found. *Possible false indications* are cases where definite information is not available although evidence indicates faulty operation. *Failures* are cases where hot boxes developed but the alarm failed to operate or the indication was overlooked. An *equipment defect* is a case where conditions were found which might have prevented the device from operating.—EDITOR]

New York Central Experience.—The committee has been advised that the Twin-Plex (smoke-and-odor bomb) alarms are now in service on more than 100,000 bearings on 60 railroads, of which approximately 35,000 are installed in

both plain and roller-bearing journals operating on the New York Central. A record of 16 cases of hot bearings detected by the Twin-Plex alarms on the New York Central System during the year between March 1, 1947, and March 1, 1948, as reported to the committee by the equipment engineering department of the railroad under date of March 11, 1948, were included in the report as Appendix B. In transmitting this record to the committee it was stated that there may have been other cases of alarms functioning, or failure to function that were not reported, but that investigation of the 16 cases reported indicated the facts to be as shown in the appendix.

Conclusions.—No particularly promising alarm-device ideas have been brought to the committee's attention, or indicated by the relatively few devices subjected to laboratory investigation at Altoona during the past year. The devices still being submitted are for the most part modifications of suggestions from previous submitters as classified in the committee's 1947 annual report.

The continuance of numerous false alarms and alarm equipment failures makes for an overall unsatisfactory and unreliable operation of the alarm devices under observation and the committee, therefore, cannot yet recommend any hot-box alarm for general use.

The members of the Committee on Development of Hot Box Alarm Devices are J. R. Jackson (chairman), mechanical engineer, Mechanical Division, A.A.R.; L. B. Jones, engineer of tests, Pennsylvania; H. L. Holland, assistant mechanical engineer, B. & O.; J. Stair, Jr., electrical engineer, Pennsylvania; J. W. Hergenhan, assistant engineer, test department, N.Y.C.

Discussion

Several members submitted written discussions and took cognizance of the fact that the conclusion of the committee's findings was to the effect that no promising alarm devices have been brought to the committee's attention or indicated by the devices subjected to laboratory investigation and that "The continuance of numerous false alarms and alarm equipment failures makes for an overall unsatisfactory and unreliable operation of the alarm devices under observation and the committee therefore cannot yet recommend any hot box alarm for general use". One member made the comment that experience on his road had indicated that many of the so-called failures to take advantage of the functioning of alarm devices were actually failures of employees to be guided by the indications. He also questioned the trend toward the use of numerous devices indicating faulty functioning of car and locomotive equipment parts with the observation that too great reliance on such indications did not contribute to maximum efficiency on the part of operating crews. Another

member citing specific example of experience with these devices said:

"For example, please compare the facts reported with respect to Device No. 3 under date of January 29, 1948 on Page 10 with those reported with respect to Device No. 4 under date of February 12, 1948, on Page 11:

"In both cases the hot bearing was first discovered by car inspectors after train arrived at terminal and in both cases the bearing was just hot enough so that lining metal was wiped. Also in each case there was evidence that alarm had functioned. In neither case, however, had the train crew noted the alarm and yet Device No. 3 is credited with a true indication whereas Device No. 4 is charged with a failure. It is explained that Device No. 3 is credited with a true indication because the failure of the train crew to notice the indication which it must have received is properly chargeable as a man failure and not as an alarm failure. No exception is taken to this; in fact one might go further and assert that even the man failure was excusable. Based upon our experience we doubt if any type of hot box alarm will prove to be effective unless a sufficient number of cars are equipped to justify the full instruction of all train crews and all others concerned. The only point we make here is that if Device No. 3 was properly credited with a true indication, Device No. 4 under like circumstances should

be credited with a true indication and not with a failure.

"Also, it is noted that in the tabular summary on Page 2, Devices No. 4, the Twinplex Alarm, is charged with a false alarm. In the chronological record of this device, however, we can find no false alarm listed.

"These two seeming discrepancies appear important to us because if Device No. 4 is credited with a true indication instead of a failure on February 12, 1948, and if no false alarm actually occurred with this device, then the summary for the Twinplex Alarm on Page 2 should read:

True Indications	1
False Alarms	0
Possible False Indications	0
Failures	0
Equipment Defects	1

"I want to emphasize that there is no thought whatever that the committee was influenced by any bias for or against any particular device. A glance at the personnel of the committee is enough to refute any such suggestion. Besides, if there had been any bias against Device No. 4, the twinplex alarm, the committee would not have taken the trouble to include in this report so much favorable evidence of the performance of this device on the New York Central, and called attention to the fact that more than 100,000 bearings on 60 railroads have been equipped with it."

The report was accepted.

CAR AND LOCOMOTIVE LUBRICATION

Laboratory studies of roller-bearing lubricants and Diesel crank-case oils among timely subjects under consideration



L. B. Jones,
Chairman

Since the 1947 report, the committee has held two meetings at Chicago, October 15, 1947, and April 8, 1948.

None of the items covered in this report require letter-ballot action.

Roller-Bearing Lubricants.—The first progress report, dated April 30, 1946, was approved by the General Committee and distributed to member roads. A brief summary of this report was included in the 1946 annual report of this committee. By reason of the use of the Indianapolis laboratory for other purposes, no work was accomplished on this project during the calendar year 1946.

The second progress report covered work accomplished during the calendar year 1947, under the immediate direction of the mechanical engineer's office of the A.A.R., and under the general supervision of this committee. In addition to the S.K.F. bearing assembly covered by the first report, the report covers tests with different lubricants on bearing assemblies supplied by Timken, Hyatt, and Fafnir, looking toward a more uniform practice by the various

railroads, especially those passenger-car runs which cover portions of several railroads between terminals. This report was submitted to the General Committee with the recommendation that copies be made available to member roads as information.

That portion of the recommendations in our 1946 annual report dealing with tests at sub-zero temperatures has not been realized, as the necessary refrigeration equipment was not available in time. A completely refrigerated testing room has been installed at the Indianapolis laboratory and it is expected to obtain low-temperature test data during the current year.

The results obtained with three additional types of roller bearings substantiate the conclusion reached in the first report, and indicate that the general type of oil now used on the railroads for lubrication of the conventional waste-packed journal box will provide a suitable and economical lubricant for roller bearings under passenger cars in interchange service.

It is recommended that the program now under way be continued to a point where specifications for unified lubrication practice for both passenger and freight equipment in interchange service may be developed and submitted for approval.

Journal-Box Wedge.—A joint committee consisting of three members of this committee, and three members of the Car Construction Committee, was appointed to review the dimensions and tolerances of the journal-box wedge and report. Since any study of tolerances necessarily involves the dimensions of the journal box, these will also be considered in the study.

The subject of reclamation of wedges was raised by the Purchases and Stores Division, and considered by the Committee on Car Construction, which, in turn, requested the advice of this committee with respect to location of wear on wedges which might justify reclamation, and suggestions as to procedure. This subject is being canvassed on the railroads represented on this committee.

Diesel Crank-Case Lubrication. — The committee finds that Diesel crank-case oils are being produced by a number of oil companies from a variety of base petroleum stocks which differ in their characteristics and behavior. In many cases, additives are used for the purpose of improving the lubrication qualities on the one hand, and mitigating the undesirable properties on the other hand. In the interest of providing reasonable latitude in the purchase and use of lubricating oil, the committee proposes to investigate those properties which influence the compatibility of oils brought together in the same crank case with the idea of establishing standards for desirable properties.

Journal-Box Lids.—Since the approval of Specification M-120-47 the committee

has been contacted by several manufacturers looking toward submission of lids for approval. The committee desires at this time to acknowledge the cooperation of the manufacturers in producing a suitable journal-box closure.

Up to the time that this report was sent to press, the following makes of lids have been formally submitted, tested, and approved: Symington-Gould No. B265A for 5 inches by 9 inches and 5½ inches by 10 inches journal boxes; National Malleable Flexo No. 4 for 5 inches by 9 inches and 5½ inches by 10 inches journal boxes; Union Spring Manufacturing Co. No. 9278-A for 5 inches by 9 inches and 5½ inches by 10 inches journal boxes and Union Spring & Manufacturing Co. No. 9279-A for 6 inches by 11 inches journal boxes.

The committee again draws attention to the fact that a journal-box lid can be no better than the box to which it is attached. Many journal boxes have been operating with loose fitting and bouncing lids, with the result that the hinge lug and hinge pin hole are badly worn. To apply a new lid to a worn journal-box hinge lug not only defeats the purpose of a suitable journal-box closure, but results in rapid destruction of the lid itself, due to rattling and bouncing. On the other hand, the application of a specification lid to a journal box in good condition produces a tight fit which eliminates bouncing and thereby largely eliminates wear.

Tests of Box Closures.—At the suggestion of the mechanical engineer, A.A.R., several railroads have instituted service tests of various combinations of journal-box closures, journal boxes being operated in similar service with various lid closing pressures, with and without dust guards, and also with and without auxiliary devices, such as deflecting strips and hooded extensions. While these tests are still in progress, the data so far available supports the general impression that a tight-fitting lid, with adequate spring pressure, is the best practical closure for the front end of the journal box.

Proposed Lubrication Manual.—The committee has undertaken the preparation of a manual which will bear the same relation to lubrication practice as the Wheel and Axle Manual, for example, bears to wheel and axle practice. Suggestions from the membership, and also from the various car foremen's associations will be appreciated by the subcommittee in charge of this work.

The members of the Committee on Lubrication of Cars and Locomotives are L. B. Jones (chairman), engineer of tests, Pennsylvania; J. W. Hergenthan (vice-chairman), assistant engineer, test department, N. Y. C.; E. C. Ellis, superintendent car department, C. & O.; A. J. Picheto, general air brake engineer, I. C.; R. E. Coughlan, chief metallurgist and engineer of tests, C. & N. W.; W. G. Aten, mechanical inspector in charge of lubricating mat-

ters, C. B. & Q.; D. C. Davis, lubricating supervisor, A. T. & S. F.; E. H. Jenkins, assistant general superintendent car equipment, Western Region, C.N.R.

Discussion

A member, in commenting on the conclusion in the report to the effect that "the general type of oil now used for the lubrication of conventional waste-packed journal boxes will provide a suitable and economical lubricant for roller bearings" made the observation that if a lighter oil is to be used for this purpose the closure will of necessity have to be more closely watched to prevent leakage.

Another member made the comment that the conventional bearing and box is definitely obsolete and that concerted action should be taken now to assure the development of a new type of journal bearing.

Speaking on the subject of Diesel crank-case oils several members commented on the confusion that is being caused on many roads due to the practice of using several different types and specification of crank case oil and emphasized the desirability of the railroads and the Mechanical Division taking such joint action as will bring about a study of the problems in connection with the lubrication of the different types of Diesel engines now in motive power service and ultimately arriving at a specification or specifications for crank case oil such as will eliminate the necessity for duplication of facilities and test work that is currently creating a difficult problem. Another speaker, in referring to the same subject, remarked that it was not possible to separate the problems of crank case oils from its relationship to the fuel oil used in Diesel engines. The character and the quality of fuel oil has a definite affect on the performance of the lubricating oil, he said. The same speaker raised several questions as to what the railroads ultimately desire in the way of lubricating oil; what is the effect of reclamation practices on the performance of crank case oil; is mileage a safe indicator of the time to make oil changes and, if not, what is the reliable indicator. He concluded his remarks with the observation that this entire matter is one that should be approached by joint research between railroads, locomotive builders and, if necessary by outside agencies that might well contribute experience gained in solving similar problems in other industries.

A member commenting on the hot-box situation called attention to the fact that were the member roads to comply with the recommended practices of the A. A. R., and particularly the requirements of Rule 66, a better average of hot-box performance could be expected. The speaker included in his remarks eight specific points of the recommendations that should be complied with. As a specific example of the experience of

one road with which the figure was connected he called attention to the hot box epidemic of last August and September and mentioned that after a thorough study of all of their experience the following conclusions as to the predominating causes for the increase in hot boxes were first: (a) waste grabs brought about by shock—speed—track conditions—causing bearings to lift either in train yard switching or while en route. (b) lack of proper attention to boxes in order that waste grabs might be controlled. Second: unsatisfactory condition of journal box packing causing a break down in lubrication. Third: dry hot weather.

Part of the study of that road involved a record of the repack date of 8,500 cars received in interchange recording only cars carrying repacked dates nine months and extending to fifteen months and over. The result was as follows:

Last Repacked Date	No. Cars	Percentage
9 Mos. Old	456	5.3
10 Mos. Old	440	5.1
11 Mos. Old	453	5.3
12 Mos. Old	422	4.9
13 Mos. Old	353	4.1
14 Mos. Old	314	3.7
15 Mos. Old & Over	597	6.9

Adding the 14 and 15 months and over cases the speaker mentioned that it could be seen that 911 cases were over date for brass examination and repack and he commented that this certainly was not a healthy condition and was one that unquestionably contributed to general bearing failure. Continuing, he said, under the best conditions the stipulated maximum repack period is high enough without having a situation where practically 7 per cent of the cars operating are 15 months old or over. This, he said, is evidence of the necessity of impressing car department people with the importance of complying with the requirements of Rule 66.

In conclusion this speaker said that, "The committee's reference to the fact that a journal box lid can be no better than the box to which it is attached is well put. After all, the contents of a journal box are the most vital part of a car and consequently should receive the best protection. More attention to the proper condition of journal boxes will enable the cover to do the job intended and prolong the lubricating qualities of the waste and oil."

The report was accepted.

may also be clad with other metals, such as nickel, etc."

The General Committee, upon recommendation of the Committee on Tank Cars, concurred in by the Bureau of



R. D. Bryan,
Chairman

COMMITTEE ON TANK CARS

Specifications modified because of a material shortage and changes in the welding and welded test-plate requirements

During the past year the committee was called upon to give consideration to a total of 443 dockets and applications for approval of designs. Two hundred and thirty-four applications covered designs, materials and construction of 6,613 new shipping containers, for mounting on new cars or for replacement on existing cars. Four applications covered the construction of twenty-three multiple unit cars to be used for the transportation of fifteen Class I.C.C.-106A500 one-ton containers each. One application covered the construction of one new car structure for the mounting of an existing cylindrical wooden tank-car tank.

One-hundred and eighty-three applications covered alterations in, additions to, or conversions and reconditioning of 3,651 existing tank cars or shipping containers. Twenty-one applications requested approval of tank-car appurtenance designs or materials without reference to specific cars.

A.A.A. Specifications for Tank Cars.—Because of the inability of the builders to secure open-hearth boiler-plate steel

of flange quality for construction of tank-car tanks the General Committee, upon recommendation of the Committee on Tank Cars, concurred in by the Bureau of Explosives, approved modifications of the A.A.R. specifications for Tank Cars of Classes ICC-103-W, ICC-103A-W, ICC-103B-W, ICC-104-W, ICC-104A-W, ICC-105A-300-W, ICC-105A400-W, ICC-105A-W, and ICC-105A600-W at paragraph AAR-3 (a) to read as follows:

"AAR-3. (a) All plates used for tank and expansion dome, where expansion dome is required, must be of open-hearth boiler-plate steel of flange quality complying with requirements of current A.A.R. Specification M-115, titled Steel, Carbon and Carbon-Silicon, Boiler and Firebox, for Locomotives, Stationary Boilers and Other Pressure Vessels or ASTM Standard Specifications A-212 titled High-Tensile-Strength Carbon-Silicon Steel Plates for Boilers and Other Pressure Vessels, Grade A and Grade B, Flange and Firebox, with the carbon content of the plates used not to exceed 0.30 per cent. These plates

Explosives, has also approved a further modification of the A.A.R. Specifications for tank Cars of Classes ICC-103, ICC-103-A, ICC-104, ICC-104-A, and AAR-203 at paragraph AAR-8 (a) to read as follows:

"AAR-8 (a) Electric seal welding of inside calking edges only, in whole or in part, using shielded-arc type of electrode is permitted on new or existing equipment, provided the weld bead has a 1/8-in. minimum to 3/16-in. maximum throat thickness. Qualification of welders must comply with requirements of specification ICC-103-W, paragraphs AAR-6 (k-1) to (k-5), inclusive. Welding clad material to edge of clad plates inside of tank is permitted. Other methods of covering edges of clad plates, if approved, may be used."

Upon request, the committee gave consideration to a reduction in the number of test plates to be prepared as prescribed by the specifications for fusion-welded tanks of Classes ICC-103-W, ICC-103A-W, ICC-103B-W, ICC-104-W, ICC-104A-W, ICC-105A-300-W, ICC-105A400-W, ICC-105A500-W, and ICC-105A600-W. The General Committee has approved of the recommendation and authorized revision of paragraph AAR-6 (d-3) of each of the above specifications to read as follows:

"AAR-6. (d-3) When there are several tanks being welded in succession, or at any one time, the plate thicknesses of which fall within a range of 1/4 in., each 200 ft. of longitudinal and circumferential seams may be considered as the equivalent of one tank and only the test plates required by paragraphs AAR-6 (d-1) and AAR-6 (d-2) need be made, provided they are welded in the same way as the joints in question. When the manufacturer is in the regu-

lar and continuous production of ICC-103-W, ICC-103A-W, ICC-103-W, ICC-104-W, ICC-104A-W, ICC-105A-300-W, ICC-105A400-W, ICC-105A500-W, and ICC-A600-W only one test plate need be made for one tank out of 20 of any of these classes, provided a minimum of one test plate per week for any of these classes is made. The test plates shall be so supported that warping due to welding shall not throw the finished test plate out of line by an angle of over five degrees."

The members of the Committee on Tank Cars are R. D. Bryan (chairman), mechanical assistant, A.T. & S.F.; L. R. Schuster, (vice-chairman), engineer car construction, S.P.; O. H.

Clark, superintendent car department, Mo. Pac.; E. R. Hauer, chief mechanical engineer, C. & O.; E. O. Joest, mechanical engineer, U.P.; A. A. Ott, chief car inspector, Pennsylvania; D. S. Clark, assistant to head, School of Mechanical Engineering, Purdue University; J. J. Root, Jr., vice-president, Union Tank Car Company; R. T. Baldwin, secretary, Chlorine Institute, Inc.; H. J. Gronemeyer, supervisor car equipment, E. I. du Pont de Nemours & Co.; R. W. Thomas, manager, research and development, Phillips Petroleum Company and T. G. Rabbitt, superintendent tank cars, Sun Oil Company.

The report of the committee was accepted.

REPORT OF COMMITTEE ON WHEELS

Report includes breakdown of derailments in freight service caused by various types of wheel failures

Cast-Iron Wheel Specifications.—The committee recommends, as a letter ballot item, that Sec. 9 (a) of Spec. M-403—Wheels, Cast Iron, for Locomotives, Tenders and Cars, be modified as follows:

Present Form: Chill Test.—The wheel selected for drop test and the wheel which has been given the thermal test shall be broken so that the chill may be examined in at least four different portions of the wheel. The depth of chill shall not be less than ½ in. and shall not exceed 1 inch at the throat and 1½ in. at the center line of tread. The blending of chill with the grey iron behind it shall be without any distinct line of demarcation. The depth of chill shall not vary more than ¼ in. around the tread in any one plane in the same wheel. These limits apply to all weights of wheels.

Proposed Form: Chill Test.—The wheel selected for drop test and the wheel which has been given the thermal test shall be broken so that the chill may be examined in at least four different portions of the wheel. The depth of clear chill shall not be less than ¾ in. and effective chill shall not exceed 1 in. at the throat and 1½ in. at center of tread. The blending of chill with the grey iron behind it shall be without any distinct line of demarcation. The depth of chill shall not vary more than ¼ in. around the tread in any one plane in the same wheel. These limits apply to all weights of wheels.

Reason: To conform with present inspection practices which promote greater accuracy and uniformity in the measurement of wearable chill metal.

If the foregoing recommendation is approved, the photograph for minimum

chill depth (Fig. 66-A in Supplement No. 1 to the Wheel and Axle Manual) will be properly marked and necessary changes made in other portions of the Wheel and Axle manual.

Cast-Iron Experimental Wheels.—Recommendation to the General Committee was made that the authority which was granted in March, 1947, to manufacture and place in service under interchange freight cars 200,000 experimental cast iron wheels, be extended to include an additional 150,000 experimental wheels to the 1947 design and marked "AAR-XI." This recommendation was approved.

The committee recommends, as a letter ballot item, that the 1947 design experimental cast iron wheel marked AAR-XI, modified with respect to hub location and length, be adopted to super-

sede the 1944 revised Recommended Practice 33-in. diameter cast iron wheel for 40, 50 and 70-ton capacity cars and, as an alternate, the same design but having a solid hub; the two propositions would become effective on March 1, 1950.

Study of Wheel Failures.—A study of wheel failures in freight service which resulted in derailments was made for the entire year 1947 from a selected list of 33 of the larger railroads with approximately 80 per cent of freight-car ownership. It represents 626 wheel derailments, of which 110 were due to loose wheels which primarily involves wheel shop practice, 53 or 11.18 per cent of the total cast-iron wheel failures and 52 or 34.21 per cent of the total steel-wheel failures being in this classification. The wheel condition causing derailment was unknown in five cases. The remaining 511 cases may be classified as true wheel failures, wheels broken or worn beyond limits, 412 or 86.92 per cent of the total cast iron wheel failures and 99 or 65.13 per cent of the total steel wheel failures being in this classification: Of the total of 511 cases, 80.6 per cent were cast-iron wheels and 19.4 per cent were wrought-steel wheels.

Freight Car Wheels in Service on 33 Roads, July 1, 1947.

	Number in service	Per cent of total
Cast-iron wheels	8,178,712	65.2
One-Wear wrought steel wheels	2,459,120	34.8
Multiple-Wear wrought-steel wheels	1,863,552	
Cast-steel wheels	39,664	
Total	12,541,048	100.0

As result of studies over the past several years, the committee recommends, as letter ballot items, that provisions be established in the Interchange Code to provide: (1.) That effective January 1, 1950, all 700-and 750-lb. single-plate non-bracketed cast-iron wheels, cast prior to 1938, be prohibited on cars in interchange service; (2.) that, effective January 1, 1952, all 700-and 750-lb. single-plate non-bracketed cast-iron wheels cast after January 1, 1938, be prohibited on cars in interchange service.

Marking Paint Color.—Authorization granted in circular letter dated February 15, 1947, for the use of a durable grade of white paint was withdrawn on January 2, 1948, and the manufacturers instructed to revert back to the use of chrome yellow paint for stenciling tape sizes on rolled-steel wheels as specified in Spec. M-107.

Proposed Wheel for Diesels.—Recommendation for a fourth class of heat-treated wheel, of immediate carbon content between Class B and Class C wheels under A.A.R. Specifications M-107, for Diesel locomotive service, on the theory that it would combine better resistance to both shelling and thermal checking, is being studied. Data is being developed through a questionnaire to the member roads and progress only was reported at this time.



E. E. Chapman,
Chairman

Cylindrical Tread Wheels.—The committee recommends, as a letter ballot item, the adoption as an alternate standard of a design of cylindrical wheel tread with 2 in. of cylindrical tread a $1\frac{3}{8}$ -in. taper at 1 in 20, and a $\frac{5}{8}$ -in. radius between the tapered part of the tread and the face of the rim. Contingent upon the foregoing receiving letter ballot approval, Sections 2 and 14 (a) of Specifications M-107 will be revised as follows to standard taper tread to be furnished unless alternate standard cylindrical tread is specified on purchase order. In paragraph 14 the words "unless otherwise specified" will be eliminated.

Review of Wrought-Steel Wheel Design.—The committee recommends, as a letter ballot item, that wheel designs F-33, CX-38, BX-40, DX-40 and CX-50 be withdrawn from the standards and temporary standards now shown in Manual Section G.

Axle Design and Dimensions.—The committee recommends, as a letter ballot item, that in the designs of cast iron wheels, the distance from the vertical reference line to the outside hub face be $3\frac{1}{2}$ in. and the nominal hub length not exceed 7 in. to permit the standardization of wheel hub location and axle wheel seat location.

Change in Gage Hardness.—The secretary was instructed to change editorially the minimum hardness value of "C-65 Rockwell" shown on Manual page B-42-F to a minimum hardness of "C-60 Rockwell," for the worn-through-chill and out-of-round gage, as announced in circular letter dated December 5, 1947.

[The failure of Diesel locomotive wheels due to hot stamp markings on the back face of the rim was investigated, but the situation was not considered sufficiently serious to warrant recommending elimination of the stamping.—EDITOR]

Symbols for Cast-Iron Wheel Defects.—Elimination of Interchange Rule 83 is being recommended by the Arbitration Committee and the secretary has been instructed to correct editorially the Recommended Practices appearing on Page G-11 of the manual and Page 72 of the Wheel and Axle Manual by eliminating reference to "Rule 83" from the description text of defects for A.A.R. Wheel Symbols 83 and 83-A.

Witness Groove in Wheel Turning.—An editorial correction was authorized in Par. 277 in the next printing of the Wheel and Axle Manual or supplement thereto, by adding to the third sentence the words "if wheel has a sharp or vertical flange."

Use of Reflectoscope.—Inquiry was made concerning the use of the Sperry Reflectoscope in lieu of magnetic particle testing. The Reflectoscope is not as sensitive to detection of surface defects in the journal, and the shape of the

car axle is such that failure would have to progress materially before detection due to axle design. This device will not come within the scope of Paragraph 355 (o).

Modifications to Manual.—To Page G-27, Sec. 1—Inside Diameter-Back Face of Rim; editorial modification was made by substituting for the words, "that specified," the following:—"the nominal dimension. The maximum diameter at this location is governed by the rim thickness and the tape size."

To Page G-27, Section 2 Inside Dimension—Front Face of Rim; recommendation was made, as a letter ballot item, for the following revision:

Proposed Form—Inside Diameter—Front face of Rim.—The inside diameter of the rim at the front face of the wheel shall not exceed that at the back face of the wheel and shall not vary under this dimension by more than $\frac{1}{4}$ in. for multiple-wear wheels. For one-wear wheels, the inside diameter shall not differ from that at the back face by more than $\frac{1}{4}$ in.

The committee recommended, as a letter ballot item, that the second sentence of Paragraphs 209 and 335 (o) of the Wheel and Axle Manual, as shown in Supplement No. 1, to revised as follows:

Proposed Form—All secondhand axles shall be magnetic-particle tested before remounting. If journal surface or end of axle has any discoloration due to overheating (light straw or dark straw or any departure from the normal bright finish of the journal), or if circumferential checks or cracks are found in journals, (etc.—no other change).

The members of the Committee on Wheels are E. E. Chapman (chairman), mechanical assistant, A.T. & S.F.; H. H. Haupt (vice-chairman), general superintendent motive power, Pennsylvania; I. N. Moseley, research and test engineer, N. & W.; M. S. Riegel, assistant engineer of tests, N.Y.C.; H. E. Wagner, superintendent car department, A. & S.; G. A. Harstad, foundry metallurgist, C.M.St.P. & P.; A. M. Johnson, engineer of tests, Pullman Company; W. R. Hedeman, engineer of tests, B. & O.; P. V. Garin, engineer of tests, S.P.; F. Holsinger, wheel-shop foreman, I.C.; B. C. Gunnell, chief mechanical engineer, Southern.

Discussion

C. E. Bryant, chief engineer, Technical Board, Wrought Steel Wheel Industry, referring to the section of the report which dealt with the Diesel locomotive wheels, said that the conditions under which these wheels operate represent an entirely new type of wheel service. The heat effects from brake shoes, he said are probably the major factor for consideration in wheel design for Diesel locomotives. He compared the requirements of three types of wheel service, one under a conventional pre-

war passenger car weighing 190,000 lb. and carried on six-wheel trucks, with a load per wheel of about 15,800 lb. To stop such a car from 60 m.p.h. requires the dissipation of 1,900,000 ft. lb. of energy. The second service condition was represented by a post-war passenger car weighing 140,000 lb. and carried on four-wheel trucks with an average weight per wheel of 18,000 lb. To stop this car from 90 m.p.h., he said, required the dissipation of 4,900,000 ft. lb. of energy—about $2\frac{1}{2}$ tons as much as under the former conditions. The Diesel locomotive represents the third set of conditions in which the wheel load is about 28,000 lb. Stopping the locomotive from 60 m.p.h. of this load requires the dissipation 3,350,000 ft. lb.; to stop the locomotive from 90 m.p.h. requires the dissipation of 7,600,000 ft. lb. He pointed out that braking ratios do not provide a significant comparison unless they are directly associated with the wheel load. A moderate braking ratio applied to the high wheel loads of the Diesel locomotive may give more trouble than a high braking ratio applied to the lower wheel loads on passenger cars.

These figures, he said, served to outline the problem and both the committee and the steel-wheel industry were trying to find an answer but, he said, there are limits to the capacity of all steels. While the answer was not yet available he reminded the members that the railroads had faced similar problems before in the case of axles, and firebox sheets in high pressure oil burning steam locomotives. A limitation on carbon steel arises mainly from the fact that it is a heat-treated material. Because of the high heat input from braking the heat treater cannot go as far as it might. The only high-alloy steels now known which might meet these conditions are too expensive. Perhaps, he said, some suitable low-alloy steel may ultimately be found, but it is not yet available.

C. M. Stoner, executive vice president, Association of Manufacturers of Chilled Car Wheels, said that the adoption of A.A.R.—X-1 chilled iron wheel as standard, was constructive. The greatest improvement in the chilled wheel, he said, has been in tread strength. The production of the wheels with the improved tread and rim metal, he said, was increasing. The information on wheel failures in the report of the committee agreed with the information which the chilled-wheel manufacturers had collected, and there has been a distinct improvement in wheel failures, he said, on wheels which have been cast during the past 10 years.

Several other points were brought out during the discussion. Exception was taken to the increase of rim thickness of steel wheels from $2\frac{1}{2}$ in. to $2\frac{3}{4}$ in. The question was raised whether increase in service metal was worth the cost since sometimes it could not be used. To take advantage of it tends to aggravate the difference in diameter

between new wheels and worn wheels when both are used on the same car. The question was raised whether it would not be possible to provide a stamp of such form that its use on the inside of the rim would not produce a notch effect referred to in the report.

There was some criticism of the requirements of magnetic testing of axles between the wheel seats—this was referred to as one of the examples of the constant trend toward increasing costs referred to in the discussion of the Car Construction report. Mr. Chapman, in answering this criticism, agreed

that there was not complete agreement among the members of the committee on this matter. He cited an instance of a destructive derailment caused by a failure of an axle between wheel seats, the avoidance of which, he said, would justify all of the expense involved in the use of the Magnaflux test. Agreement with the committee on its suggested intermediate carbon range for Diesel locomotive wheels was expressed by one member.

The report was accepted and its recommendation submitted to letter ballot.

Design 1 axle would not develop fatigue cracks, or for any quantitative evaluation of axles of Designs 2 or 3.

The second progress report, dated November 1, 1938, covered further tests on axles of the same three designs. The results of these tests were:

The 11,000 lb. per sq. in. endurance limit for the Design 1 axle was confirmed and 9,000 lb. per sq. in. was fixed as a preliminary figure for the stress below which no cracks develop in the wheel seat in at least 150,000 equivalent miles. The body portion of the axle has a capacity about 40 per cent greater than the wheel seat, assuming Reuleaux loading.

For the Design 2 axle (7 $\frac{1}{8}$ -in. wheel seat, no black collar) the endurance limit was found to be 14,000 lb. per sq. in. an improvement of 27 per cent over the 1928 standard (Design 1) axle. Because of the increased section modulus, this axle design can carry a load 64 per cent greater than the 1928 standard axle without breaking in the wheel seat. Sufficient tests were not run to determine the stress at which fatigue cracks will not be initiated in the wheel seat, but a value of at least 12,000 lb. per sq. in. was indicated. Assuming this improvement, an increased axle capacity before development of fatigue cracks of 72 per cent was indicated, possible by the use of the Design 2 axle compared to Design 1. This increase could be fully realized without danger of breaking the body portion of the axle.

The Design 3 axle (8 $\frac{1}{8}$ -in. wheel seat, no black collar) did not break off in the wheel fit unless stressed beyond 16,000 lb. per sq. in. The capacity of the axle based on fatigue strength in that portion was indicated to be 127 per cent above the Design 1, and 38 per cent above the Design 2 axle. These values are not significant because the body portion of the axle is weaker than the wheel seat section in this design. For that reason no further tests were run on this type axle.

The third progress report, dated June 1, 1939, covers tests on axles of Designs 1 and 2, which are described above, and on two new Designs 4 and 5. There was some question whether the wheel seat diameter of 7 $\frac{1}{8}$ -in. for Design 2 would permit the use of existing wheels without danger of reducing the hub thickness of the wheel below safe values. For this reason axle Design No. 4 with a 79/16-in. diameter wheel seat and without black collar was tested. The body diameter of this axle was increased $\frac{1}{8}$ -in. adjoining the wheel seat and 1/16-in. at the center over the Design 1 axle. Design 5 is one sometimes used in service for increased load capacity. Its body and wheel-seat diameters are those of a 1928 standard A.A.R. 6-in. by 11-in. axle with the black collar; its journal dimensions are 5 $\frac{1}{2}$ -in. by 10-in.

The results of these tests were:

The 11,000 lb. per sq. in. endurance limit and 9,000 lb. per sq. in. initial

RESEARCH TO IMPROVE AXLE DESIGN

Summary of the results of axle tests conducted over a ten-year period—Report on tender-axle relief grooves

The Committee on Axle Research, organized in 1937, was given the assignment of determining the fatigue strength of the then A.A.R. standard (1928) all-purpose black-collar axle design and developing data on which to base the design of a car axle having a higher factor of safety against fatigue failures in the wheel set fit.

In December, 1937, a higher number of fatigue tests, mostly on full size 5 $\frac{1}{2}$ -in. by 10-in. axles, have been run on the testing machines at the plant of the Timken Roller Bearing Company, Canton, Ohio. During the ten-year period, 1938-1948, six progress and two special reports have been issued and the seventh progress report is in preparation.

The axle research program at the Canton laboratory is being continued on a group of heat-treated axles of the 1940 passenger-car design for comparison with the as-forged and a limited number of normalized and tempered axles previously tested.

The tangible results of the research program were the adoption of a new passenger-car axle in 1940 (Research Design No. 6), and the Urschel-Pittsburgh tubular axles as an alternate standard in 1941. The 1928 standard black-collar axle, smooth forged between wheel seats, is still the standard freight axle.

Summary of Progress Reports

The first progress report, dated May 1, 1938, dealt with three types of axles as follows:

Design 1—The 1928 standard A.A.R. 5 $\frac{1}{2}$ -in. by 10-in. car axle, having a 7-in. wheel seat diameter.



J. R. Jackson,
Chairman

Design 2—Axles varying from the 1928 standard by an increase in the wheel seat diameter to 7 $\frac{1}{8}$ -in. and removal of the black collar.

Design 3—Axles varying from the 1928 standard by an increase in the wheel seat diameter to 8 $\frac{1}{8}$ -in. and removal of the black collar.

All axles in these and subsequent tests were run with wrought-steel wheel disks unless otherwise stated.

The results of these tests indicated that the allowable wheel-seat fatigue stress (on the basis of 84,300,000 stress reversals, or 150,000 equivalent miles) for the 1928 standard (Design 1) axle was 11,000 lb. per sq. in.

Insufficient data were available to find values for the stress at which a

crack limit were confirmed for the Design 1 axle. Similar values of 14,000 lb. per sq. in. and 13,500 lb. per sq. in. respectively were established for the Design 2 axle. Several tests were made with axles having a 2½-in. radius fillet adjoining the inside hub face of the wheel seat. The larger fillets eliminated cracks which occurred with the 1½-in. radius fillets.

The endurance limit of the Design 4 axle was indicated as 14,000 lb. per sq. in. and the initial crack limit, 12,000 lb. per sq. in. The values for the Design 5 axle had not been definitely determined, but did not appear to be very favorable.

Of the 68 axles tested up to that time, 11 developed failures in the body. None of these axles was of Design 1. The Designs 2, 4 and 5 axles broken in the body were cracked in the wheel seat at the time of the failure. It appears that the minimum endurance limit of the axle body is approximately 17,500 lb. per sq. in.

The tests up to this point indicated that the raised wheel seat and the elimination of the black collar would increase the initial crack limit of the axle by as much as 50 per cent.

The fourth progress report, dated April 1, 1940, covered the added design (Design 6) representing a combination of Designs 2 and 4 which was added to accommodate wheel-mounting tolerance conditions, to minimize the scrapping of existing wheels due to having too thin a hub section, and to maintain the same axle body diameter at the center and approximate taper as exists on 1928 standard axles. For the purposes of this test the data of Designs 4 and 6 may be used as pertaining to one design, because the wheel seat portions are identical.

A limited number of axles from normalized and tempered material were tested. All others were machined from as-forged axle stock.

The results of these tests were:

Axle Design 6 was rated as the best of the designs tested and was recommended for adoption as the new A.A.R. standard for passenger car axles. It gives an allowable design fatigue stress in the wheel seat 60 to 80 per cent greater than the 1928 standard design. (Part III covers redesign methods and calculations).

Insufficient data had been gathered to formulate a decision about the advantage offered by normalizing and tempering of axle stock.

The fifth progress report, dated May 27, 1941, covered another group of tests of Design 6 (new 1940 standard) to study the effect of normalizing and tempering to A.A.R. Specification M-104, and of variations in carbon content within the range of material specification No. M-101. The effects of reducing wheel hub thickness to ¾-in. adding a relief groove at the position of the black collar on the 1928 Standard axle, and flame hardening, or metal spraying the axle wheel seat

were studied. The report also submits some fatigue data on tubular types of axles.

Tests on one-quarter-size scale models were run to study methods of clamping the generator pulley to the body of the axle in a way to prevent excessive stress concentrations.

The results of these tests were:

It was found that the as-forged axles with carbon content near the minimum range in Specification M-101 (0.39 to 0.43 per cent) had a higher endurance limit than either the higher carbon as-forged or the normalized and tempered axles. The as-forged axles tested also had a larger spread between the endurance limit and initial cracking limit than the Specification M-104 axles. The higher carbon content material provided the highest initial crack limit.

The tests with ¾-in. wheel hubs indicate that no hub failures are caused by the decrease in hub thickness, and that no appreciable effect on the axle fatigue stress can be noted. The relief groove at the black collar location on Design 1 axles tends to show some increase in the endurance limit of the 1928 Standard axles. The tests are being continued to obtain quantitative results.

Two Design 1 axles were metal sprayed and two flame hardened in the wheel-seat portion to find whether these processes may help to prolong the life of this type axle. Results were sufficiently encouraging to continue this phase of the investigation.

The Urschel-Pittsburgh type tubular axle tested was found to have an incipient crack limit of 13,500 lb. per sq. in. which is a 12 per cent improvement over the new standard (Design 6) axle. The rate of crack propagation in the Urschel axle was less than in the Design 6 axle. Carnegie-Illinois hollow axles gave comparatively poor results, while Timken hollow-axle tests with a number of widely different heat treatments showed no definite trend. Results of tests, also not very conclusive, on Dominion Foundries and General Steel Castings hollow axles are shown in the tabulation as a matter of record.

Tests on one-quarter-size scale model axles revealed that ½ in. thick steel split bushings between the pulley and the axle are as detrimental to axle fatigue strength as the press fit of a wheel.

The use of a rubber bushing, or corrugated steel sleeve between the pulley and axle was found to give much higher axle fatigue strength than that obtained with the steel split bushing.

The sixth progress report, dated September 17, 1942, gives the results of tests using wheels with ¾-in. hubs; the effect of clamping generator pulleys on axles, and the use of rolled wheel fits. Axle Designs 7 and 8 were introduced and tested. Design 7 has a relief groove machined in place of the black collar on the Design 1 axle. Design 8 has the black collar machined down to wheel seat diameter size. Both types

are designed to increase the life of 1928 Standard axles now in use.

The results of these tests were:

Tests data indicate that reduction of the minimum hub thickness on 5½-in. 10-in. wheels to ¾-in. results in neither slipping of the wheel on its seat nor early fatigue failures in the hub.

The clamping action of a generator pulley on passenger-car axles tends greatly to decrease the axle fatigue strength of the body portion of the axle between the wheel fits. Of the three designs tested the Pullman rubber bushing had the least detrimental effect. Corrugated steel bushings decrease the allowable stress in inverse relation to their length. Water spray on the clamped area decreases the permissible stresses considerably beyond mere clamping.

Fatigue tests on second-hand axles (both 1928 and prior standard) and their modifications (black collar machined off) revealed that, compared to new 1928 axles they have 22 per cent less resistance to initiation of fatigue cracks, but the same endurance limit. The Design 7 axle with a relief groove increased the endurance limit from 11,000 lbs. per sq. in. to 12,500 lbs. per sq. in. Design 8 (no black collar) indicated no improvement over Design 1.

Tests on new axles showed an increase in endurance limit of 27 per cent for axle Design 7A (relief groove ½-in. from inside hub face) and 63 per cent for Design 7B (relief groove flush with wheel hub) over Design 1 (1928 Standard). The improvement in initial cracking limit may be about half that amount.

Cold rolling wheel fits increases the endurance limit of the Design 6 axle. The rate of fatigue crack propagation is considerably retarded by cold rolling. Exact quantitative results are not available.

The seventh progress report, now in preparation, covers the complete investigation of axles conforming to A. A. R. Material Specification M-101 (non-treated alloy steel). Ten Design 1 (1928 Standard) and nine Design 6 (1940 Standard) passenger-car axles were tested to compare their fatigue strength in cast-iron vs. wrought-steel wheel disks, and six additional Design 6 axles were tested for body fatigue stress.

The results of these tests were:

It was found that in cast-iron wheel disks there is little difference in the endurance limit of designs 1 and 6 axles, whereas the Design 6 axle is superior to the Design 1 in wrought-steel disks. For both designs the cast-iron wheel was less detrimental in terms of initial cracking limit and fatigue crack depth than the wrought-steel wheel.

	Endurance limit, 16 per sq. in.		Initial cracking limit, 16 per sq. in.	
	Cast Iron Disk	Wrought Steel Disk	Cast Iron Disk	Wrought Steel Disk
Design 1	15,000	11,000	12,000	9,000
Design 6	16,000	16,000	12,000	9,000

Of the six Design 6 axle bodies tested at this time, none broke at a stress less than 20,500 lb. per sq. in. in the body. Experience with over 100 axle bodies indicates, however, that the minimum fatigue stress in the unrolled body portion is 17,500 lb. per sq. in., although some axles did not break at stresses as high as 25,000 lb. per sq. in. in 150,000 equivalent miles operation.

Axles with Generator Pulleys

The report called the attention to special reports covering supplementary investigations at the Canton laboratory on tests of 5½-in. by 10-in axles with generator pulleys. A special test was run for the Pennsylvania to study further the effect of clamping pulleys on passenger car axles.

The results of these tests were:

The allowable stresses in the axle body to prevent breaking off were found to be 19,500 lb. per sq. in. for A, 18,500 lb. per sq. in. for B, less than 17,900 lb. per sq. in. for C, and over 23,000 lb. per sq. in. for D. The results supplement the A.A.R. tests described in the Sixth Progress Report.

Tests of Tender Axles

In 1942 the committee was informed of the prevalent service condition of fatigue cracks developing in the wheel seats of 6½-12-in. 1928 Standard A.A. R. axles under six-wheel locomotive tenders on the Norfolk & Western, and suggested that the initiation and development of these fatigue cracks into axle failures might be prevented by machining relief grooves at the black collar locations. Acting on the committee's suggestion, the railroad undertook a road-test program, starting late in 1942 and early 1943. Four complete tender sets (24 axles) were selected from axles removed from service on account of fatigue cracks having developed in the wheel seat between the black collar and inside of wheel hub face. The cracks were removed by machining off the black collars and providing relief grooves as shown in Fig. 1. The modified 6½-12 in. axles were proportioned to the experimental Design 7, 5½-10-in. axles included in the laboratory test program.

The four tender sets (24 axles) applied for service tests had the following wheel-seat finishing variations, in addition to the machined and cold-rolled relief grooves:

Solid Bearing Axles: Six axles with wheel seats machined only; six axles with wheel seats cold rolled after machining and six axles with wheel seats flame hardened after machining.

Roller Bearing Axles: Six axles with wheel seats ground only.

The results of these tests were:

As of September 30, 1947, the railroad reported 18 out of the original 24 reconditioned axles still running and that they had made from 237,707 to 331,880 service miles per axle. Four of the solid-bearing axles had been

scrapped on account of hot journals, and one additional solid-bearing axle was lost. One roller-bearing axle had been scrapped on account of rotation of the inner bearing race on the axle and fine circumferential cracks in the wheel seat, approximately one inch from the outer edge.

No conclusive information had developed relative to the various wheel-seat finishing operations included in these 24 reconditioned axles.

The Norfolk & Western was so favorably impressed with the results of these original tests of the 24 reconditioned 6½-in. by 12-in. axles with machined and cold rolled relief grooves that a total of 188 additional new roller-bearing tender axles, conforming to Fig. 1, had been placed in service as of October 21, 1947. After five years of service experience they have concluded that the relief groove has proved beneficial in preventing the development of fatigue cracks at the inner end of the wheel seat.

Letter Ballot Items

The following actions approved by this committee and concurred in by the Committee on Car Construction, were recommended for action as 1948 letter ballot items.

1—Axles under cars in BX service. All new cars built after January 1, 1949, or cars converted for BX service after January 1, 1949, shall be equipped with A.A.R. 1940 standard passenger-car axles (page D-3-1947, Manual).

2—Adoption of the A.A.R. 1940 standard passenger-car axle as A.A.R. standard all-purpose axle. Present standard for new passenger-car axles, adopted in 1940 (page D-3-1947, Manual), to be made standard for all purposes and to replace the present standard black-collar axle for freight cars, adopted in 1928, (page D-6-1947, Manual); effective date to be established.

The members of the Committee on Axle Research are J. R. Jackson (chairman) mechanical engineer, Mechanical Division, A.A.R.; T. P. Irving, engineer of car construction, C. & O.; T. D. Sedwick, engineer of tests, C. R.I. & P.; J. A. Gower, assistant mechanical engineer, Pennsylvania; K. Cartwright, chief mechanical engineer, N.Y. N.H. & H.; J. B. Blackburn, engineer of motive power, C. & O.; H. H. Haupt, general superintendent motive power, Pennsylvania; A. M. Johnsen, engineer of tests, Pullman Company; G. W. Bohannon, assistant chief mechanical officer, C. & N.W. and E. L. Johnson, assistant chief engineer motive power and rolling stock, N.Y.C.

Discussion

The attitude of several people toward the value of the information submitted in the axle research report is typified by the following abstract of a written discussion submitted. "I doubt whether axles of the former M.C.B. and A.A.R. designs when used under tenders were

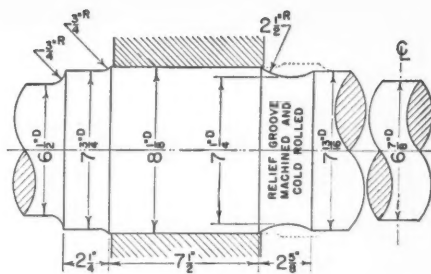


Fig. 1—Location of relief groove in N.&W. tender axle

ever sufficiently free from fractures to be regarded as entirely satisfactory. Trouble of this nature seems to have increased with every step in the progressive increases in tender capacity, weights and speed. When viewed in the light of experience, the 5½ in. by 10 in. axle, the subject of this research, was a particularly bad offender. The design of this axle was checked according to every available formula or standard and found to be correct; however, the axles continued to fail as they had done over a long period of time. The report of the committee sheds much light upon the reasons for these continued failures, but the basic part of the information comes to us about 30 years too late."

Continuing, he said, on our road, "the problem of the 5½ in. by 10 in. tender axle was solved by a long series of studies, including the nature, location and extent of fractures, locomotive mileages, etc. As a result of these studies, wheel fits were progressively and arbitrarily increased in diameter until failures in this location ceased. As wheel fit failures abated, the frequency of failures in the body portions of the axle increased, and one failure of this kind resulted in a disastrous accident to an important passenger train. The middle portion of the axle was then reinforced substantially and promptly. At the conclusion of this program the diameter of wheel fit stood at 7½ in. and the middle portion of the axle was cylindrical 7 in. in diameter with fillets of 16 in. radius joining the cylindrical portion of each of the wheel fits. This design remains unchanged as of this date, and I can count on my fingers all of the fractures that have been reported, as regards friction bearing axles, in 30 years.

"The studies and developments which resulted in the above mentioned reinforcements required a period of approximately five years for completion. Had the data which has been disclosed in this report been available at that time, the design could have been corrected over night, some unnecessary weight could have been saved in the design of the axle, and several very expensive accidents might have been avoided. The real purpose of the foregoing narrative is to emphasize the value of research and not to brag about what was accomplished—although we

are not ashamed of what we have done.

"The committee, in addition to reinforcing the points of basic weakness in the 5½ in. by 10 in. axle design, has developed other information of value through its research work. One of the most important of these developments has been the elimination of the black collar, a long overlooked stress raiser located at a vital spot in the axle. I had to think about this for a long time before visions of derailments due to wheels becoming loose and shifting on axles, disappeared from my mind, but both the black collars and the visions are now gone and I am glad of it.

"Another very interesting development in this research has been the strengthening effect of surface hardening of wheel fits either by work hardening or heat treatment. I believe exterior surface hardening is the secret of the success of the hollow axle which was recently adopted as an alternate standard.

"I have been surprised at the low stresses which have been set up as endurance limits and initial cracking limits for the 5½ in. by 10 in. axles. I am mystified by the statements which have been made in attempting to distinguish between these limits. . . . I am still unable to understand why repeated stresses of sufficient magnitude to initiate fractures would not also propagate them to final completion. The inference is that surface cracks which do not progress are produced by extreme and unusual forces acting upon wheel flanges. I find it difficult to accept such an explanation. In view of my inability to understand this matter, I intend, when using the research data, to regard the stresses which are shown as initial cracking limits, to be the maximum stresses for which axles should be designed.

"New passenger car axle designs adopted in 1946, and now proposed for freight cars, are shown and described on Page D-3 of the Manual in terms of diameters and lengths. These axles are also being considered for locomotive tenders. This system of specifying design details would pass without question if it were not for the fact that we now find axles of the same journal size used with wheels varying in diameters between the limits of 33 in. and 42 in. The increase in bending moment produced by a horizontal force acting upon the flange of a 42 in. wheel would be roughly 12 per cent greater than that produced by an equal force acting upon the flange of a 36 in. wheel, which I believe was the size considered in the research. I feel that this difference in wheel diameters is too large a factor to be overlooked.

The report was accepted and the recommendations submitted to letter ballot.

PRICES FOR LABOR AND MATERIALS

Revisions reported—Obsolete items removed—Modifications proposed for the simplification of billing



T. J. Boring,
Chairman

In order that the rules may currently provide an equitable basis for interroad billing, the committee has continued the work of analyzing material, labor and new equipment costs in A.A.R. Interchange Rules 98, 101, 107, 111 and 112 of the Freight Car Code, and Rules 21 and 22 of the Passenger Car Code, with a view of determining and recommending necessary changes to be made in the next supplement to the current code.

Rule 101

All miscellaneous material prices in Rule 101 were rechecked as of March 1, 1948, quotations submitted by the purchasing agents of the ten selected railroads, representing 39 per cent of total freight-car ownership in the United States and Canada, showing an upward trend in material markets as indicated by detail recommendations for revisions shown under this rule.

New note is added following Item 73 and also following Item 84, to provide an arbitrary charge of 55 per cent of the new price in all cases where the emergency portion or service portion of the AB valve is renewed on authority of defect card because of damage by fire.

The note preceding the table covering extra heavy pipe fittings (Items 99 to 99-H) is modified, to indicate that pipe nipples need not carry the markings prescribed therein; also eliminating the size marking requirement of the note for all fittings.

Items 145, 146, 149, 150, 151, 153, 154, that the geared hand brake approved

under 1942 specifications is intended. A new note is added following this item to provide for charges where substitutions of approved and non-approved types of geared hand brakes are involved.

Item 127-B is modified, to include size, kind of material, and to indicate that the swivel yoke specified is an A.A.R. alternate standard.

Item 133 is modified, to indicate that a No. E-2 malleable-iron cap for the coupler top-lock-lift hole is intended. New Item 133-A is added, to provide charge for No. E-2-A pressed-steel cap for the coupler top-lock-lift hole.

Items 145, 146, 149, 150, 151, 153, 154, 154-A, 156, 157 and 157-A are eliminated because infrequently used or obsolete, the committee being unable to obtain current costs on these types of doors. To provide for the few cases where such details might be renewed, a new note is added following Item 156-C.

First paragraph of note on page 202 covering friction draft gears is modified, eliminating Westinghouse D-2, D-3, and D-4 draft gears therefrom.

Note 3 following Item 250-K is modified, to indicate conditional approval for Waughmat Twin Cushion Type WM-4-6 draft gear for unlimited application to cars in interchange.

Draft gears listed under Items 251, 251-D, 251-E, 251-G, 253, 253-F, 254-C, 256, 257, 257-C and 257-F of Section II (Non-approved Friction Draft Gears) are transferred to Section III (Obsolete Types of Friction Draft Gears), and prices changed accordingly, as recommended by the Committee on Couplers and Draft Gears.

The next to the last item in the table of weights of coupler yokes on page 212 is modified. table of weights of coupler yokes on page 212 is modified.

A new table is added to this rule covering Weights of Horizontal Draft Gear Keys.

Rule 107

Item 28 is modified and a new note added following Item 60, to clarify the intent.

A new note is added following Item 143, to provide a revised method for charging for running-board end cleat or extension block applied separately.

A new Item 153-A is added, to provide a combination charge for spring plank and other details applied at the same time to trucks having other than

unit-type cast-steel sides. Items 254 and 255 are modified to indicate that unit-type truck sides only are intended, and a new note is added following each of these Items to provide a combination charge for spring or R. of journal-box bolts where other than cast-steel truck sides are involved.

A new note is added following Item 256 to provide a charge for application of truck springs, etc., on an empty-car basis, where the same end of the car is jacked for other repairs.

Note following Item 278 is modified to clarify the intent.

Items 281 and 281-A are modified, to clarify the intent as to the dividing point between charges at low and high rates.

Table heading on page 240 is modified, to indicate that truck combination labor charges in the items following apply to trucks with unit-type truck sides only.

The note under Item 327 is modified to clarify the intent.

Rule 111

No modifications are recommended in this rule.

Rule 112

Recommendations are made in this rule respecting reproduction pound prices of new freight cars of all classes, in order that the Supplement of August 1, 1948, may reflect 1947 costs in lieu of figures shown in the present Code. New prices recommended are based on the cost of 37,712 freight cars constructed during the year 1947.

Passenger Car Rule 21

No modifications other than changes in allowances are recommended in this rule.

Passenger Car Rule 22

Note 1 following Item 41-A is modified, to indicate the metallic connector coupler head should be excluded when computing the total charge for repairing the connector on a car. Note 2 following Item 41-A is modified, to include Franklin metallic connectors. A new fourth note is added to this rule, to clarify the intent as to charges where both terminal heating and precooling operations are performed on the same car in line service at originating terminal for the same departure.

Other Matters

Time studies are being made by a special subcommittee covering periodic attention to AB and AB-1-B air-brake equipment, Items 15 and 15-A of Rule 111. At the same time, studies are being made covering periodic attention to other types of air brakes for which average allowances are not now provided. When studies are completed and the results justify modification of existing allowances or the addition of new items, such changes or additions will be made.

In considering the subject of simplification of the pricing rules, in an effort to effect further economies in the cost

of car repair billing, your committee has given consideration to the adoption of an improved arrangement of such rules as well as the elimination of obsolete items and consolidations of items to eliminate extremely fine divisions. The modifications proposed herein will eliminate a net of 122 items from the rules and will simplify the pricing, and it is felt will result in a decrease in correspondence regarding billing transactions. The recommendations submitted are explained in detail under the individual rules.

The proposed modifications have been checked and approved by the Arbitration Committee and, if adopted, it is recommended same be made effective on January 1, 1949.

The committee pointed out that the prices and allowances were omitted from the items shown in the price rule simplifications because there will be changes in some of the prices when these items are carried forward to the 1949 Code. Furthermore, prices are not involved in the proposals submitted under Appendix A, because they concerned only changes in the form of the price rules. All price changes as

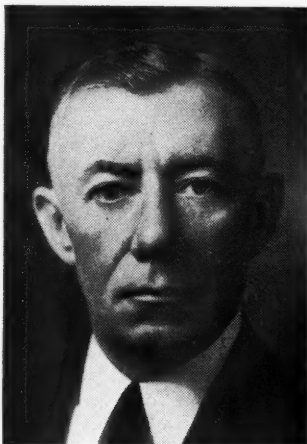
well as other modifications of the price rules which are to become effective on August 1, 1948, are listed in detail in the regular report.

It is the intent of the committee to investigate labor and material costs again in October and, if sufficient change develops, necessary revisions will be made and inserted in the rules effective January 1, 1949.

The members of the Committee on Prices for Labor and Materials are T. J. Boring (chairman), general foreman, M. C. B. Clearing House, Pennsylvania; P. F. Spangler (vice-chairman), assistant superintendent motive power, St. Louis-San Francisco; J. D. Rezner, superintendent car department, Chicago, Burlington & Quincy; L. B. George, assistant chief motive power and rolling stock, Canadian Pacific; G. J. Flanagan, general car inspector, New York Central; J. J. Root, Jr., vice-president, Union Tank Car Company; A. H. Gaebler, superintendent car department, General American Transportation Corporation; G. R. Andersen, superintendent car department, Chicago & North Western.

The report was accepted.

REPORT ON SAFETY APPLIANCES



R. G. Henley,
Chairman

The committee has approved the following designs of metal running boards for box and other roofed cars (including type "LO" covered hopper cars), and for metal brake steps for all cars, for conformity with the A.A.R. Specifications as to width, clear opening, deflection under load and non-skid features:

Steel Running Boards.—Apex Tri-Lok, Type A; Blaw-Knox Electroforged,

Type 8 J-16; Champion; Irving Type AA Grating; Kerrigan Weldforged Grating, Type KCW; Morton Open-Grip; U. S. Gypsum Expanded Metal, Type A.

Aluminum Running Boards.—Apex Tri-Lok; Morton Open Grip;

Steel Running Boards for Tank Cars.—Apex Tri-Lok, Type B; Blaw-Knox Electroforged, Type P-16; Kerrigan Weldforged Grating, Type KTC; U. S. Gypsum Expanded Metal, Type B.

With the concurrence of your committee, the Arbitration Committee is recommending in its report this year a revision of Note 1 to Par. (r-7) of Interchange Rule 3 to permit the use of lighter-section dome steps and dome platforms on tank cars complying with the specifications for metal running boards for box and other roofed cars, where supports are centered not to exceed 48 in.

A number of applications have been submitted covering dome steps and dome platforms where thickness of material used does not conform to A.A.R. approved type for either "Box Cars" (with supports centered not to exceed 4 ft.), or "Tank Cars" (with supports centered over 4 ft. but not more than 10 ft.), indicating a need for an intermediate type of metal running board where the length of the unsupported span is over 4 ft. but not more than

7 ft. In view of this, it is recommended, as a letter-ballot item, that last paragraph of Sec. 3 of A.A.R. Specifications for Running Boards Other Than Wood, etc., be modified as follows:

Proposed Form. Construction to be such as to permit sections of unsupported length up to 48 in. without exceeding $\frac{1}{8}$ in. deflection under a 200 lb. static load applied at the center of the section. or sections of unsupported length over 4 ft. but not more than 7 ft. without exceeding $\frac{1}{4}$ in. deflection under a 200 lb. static load applied at the center of the section, except that for tank-car running boards the construction to be such as to permit section or sections of unsupported 10 ft. without exceeding $\frac{1}{4}$ in. deflection under a 200-lb static load applied at the center of the section.

Subject to approval of this proposition by letter ballot of the members,

the Arbitration Committee is requested to make conforming revisions in Interchange Rule 3, in the 1949 Code.

It is expected that road tests of the ABLC brake equipment will be conducted during the coming year under the direction of your committee in cooperation with the Committee on Brakes and Brake equipment.

The report was signed by R. G. Henley (chairman), general superintendent motive power, N. & W.; H. T. Cover, chief motive power, Penna.; J. E. Goodwin, chief mechanical officer, C. & N.W.; F. K. Mitchell, general superintendent motive power and rolling stock, N.Y.C. System; J. M. Nicholson, assistant to vice-president, A.T. & S.F.; A. K. Galloway, general superintendent motive power and equipment, B. & O.

The report was accepted and recommendations submitted to letter ballot.

REVISION OF THE LOADING RULES

Completed subjects are included in Supplement No. 1 to Open-Top Loading Rules of May 15, 1948

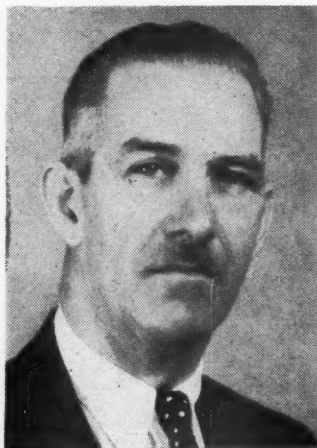
All subjects handled by the Committee on Loading Rules for the past year have been included in Supplement No. 1 to the June 15, 1947, issue of the Open Top Loading Rules, dated May 15, 1948.

The American Iron and Steel Institute Subcommittee on Loading Rules met with a subcommittee of the A.A.R., and a number of the important revisions to the various methods of loading steel products as contained in Supplement No. 1 are the result of careful planning and study by these subcommittees. The new methods of loading were only adopted after shock tests had been conducted at various shippers' plants, and numerous shipments forwarded under experimental load cards to determine the effectiveness of the proposed methods.

Farm and Road-Making Machinery.—The Traffic Committee of the Farm Equipment Institute met with the Committee on Loading Rules for the purpose of discussing revision of the tractor rules to overcome the difficulty that was being experienced with machines falling off cars enroute. The Farm Equipment Institute appointed two subcommittees, one to cover crawler-type tractors, and one to cover wheel-type tractors, to meet with the A.A.R. subcommittee. Revised figures, as well as the new figures, have been completed and are included in Supplement No. 1.

The Traffic Council of the Grading and Road Making Industry also selected a committee from their group for the purpose of working jointly with our

committee in the preparation of suitable loading specifications to govern the loading of grading and road-making equipment on flat cars. A program is under way to establish definite loading specifications and drawings for the various types of grading and road making equipment, as well as any necessary modifications which might improve the present loading specifications. It is hoped this assignment can be completed during the year, and all pertinent information, including specifications, drawings, photographs, etc., included in a separate pamphlet to the Open Top Loading Rules and issued to all concerned.



W. B. Moir,
Chairman

War Assets Loadings.—It was brought to the attention of the Committee on Loading Rules that considerable confusion exists in the preparation, handling, blocking and in inspection of machinery for shipment from War Assets storage depots and other sources, which is resulting in excessive damage claims. Some of the conditions reported are as follows: (1) improper blocking of the movable parts of machines equipped with traversing tables, movable heads, rotating parts, suspended motors panels, cages, etc.; (2) improper securing of counterweights; (3) loose cap screws, studs, shaft keys, etc.; (4) improper type and sizes, as well as broken and deteriorated skids; (5) suspended motors, gear boxes, control panels, etc.

It is the responsibility of the railroads to ascertain that shipments are prepared in accordance with the methods outlined in the Special Supplement containing regulations and diagrams covering the loading of machines on flat or in gondola cars, which was issued by the Mechanical Division of the A.A.R. under date of August 15, 1945, and which is effective until rescinded. The railroads should impress upon the shippers, regardless of the representatives preparing the shipments, the importance of properly securing the attachments and movable parts of the machines, as well as the proper blocking of the machines themselves on the car.

In an effort to substantiate claims for improvement in existing figures covering various products, the Committee on Loading Rules has repeatedly, through the secretary, requested information from the carriers regarding disarrangement of lading enroute. While only a small portion of the loads adjusted are reported, those received do not reflect sufficient information to convince the shippers that increased loading expense is justified. Your committee again urgently requests that all pertinent information regarding failure of shipments enroute be properly transmitted to the secretary, in order that the matter can be handled intelligently with the shippers.

Requests are often made by member roads for increased securing on commodities which have become disarranged enroute. However, after careful study of the reports accompanying such requests the committee frequently finds that the trouble is confined to endwise shifting of lading which has been brought about by rough handling. This is a matter for the member lines to police, in so far as train handling and yard handling of loads susceptible to endwise shifting is concerned.

Each railroad should assign a competent man familiar with the Loading Rules to follow up the application of the rules, both with the employees and the shippers, in order to bring about a better understanding of the loading rules, and to insure proper loading. If such action is taken by the member

lines considerable improvement will be brought about. It will also expedite the movement of shipments from point of origin to destination and should promote better relations between the shipper and the carrier. In addition to the above, it will materially reduce the expense now being incurred due to adjustments enroute and damaged conditions of lading upon arrival at destination, caused primarily by careless and improper loading, and, in our opinion, will be money well spent.

[In Section A the committee presented the specific revisions in Supplement No. 1 to the Open-Top Loading rules, and in Section B commented briefly on the 20 subjects still under consideration.—EDITOR]

The members of the Committee on Loading Rules are W. B. Moir (chairman), chief car inspector; Pennsylvania; C. J. Nelson (vice-chairman),

superintendent of interchange, Chicago Car Interchange; T. W. Carr, superintendent rolling stock, Pittsburgh & Lake Erie; A. H. Keys, superintendent car department, Baltimore & Ohio; G. D. Minter, district car inspector, Norfolk & Western; H. S. Keppelman, superintendent car department, Reading; G. R. Andersen, superintendent car department, Chicago & North Western; H. H. Golden, supervisor A.A.R. interchange and accounting, Louisville & Nashville; H. J. Oliver, assistant motive power (car), Detroit, Toledo & Ironton; F. A. Shoulty, assistant superintendent car department, Chicago, Milwaukee, St. Paul & Pacific; F. Fahland, mechanical engineer, Union Pacific; L. E. Day, district master car repairer (general shops), Southern Pacific; L. T. Donovan, supervisor of A.A.R. Loading, Mechanical Division, A.A.R.

The report was accepted.

York. This test covered a period of about five months during which the test unit functioned satisfactorily until the advent of freezing weather when difficulties were encountered due to the rotor sticking.

This was corrected by installation of steam coils and insulation.

Concurrently, tests of a model treatment device in the Project Laboratory were continued. In view of the relatively limited use of toilet hoppers in branch-line or other service where traffic is light, investigation is being made of various practical means for the retention of wastes, including (a) permanently installed metal containers which would be drained and cleaned in place, (b) removable metal containers or tanks which can be readily dismounted and replaced with clean and sterilized tanks and (c) disposable containers, preferably of combustion material.

The committee intends to continue the development of the complete treatment device and retaining receptacles and special attention will be given to the collection and treatment of toilet wastes on multiple-room cars, which presents many difficult problems.

In progressing this investigation, due consideration is being given to the practical and financial aspects. The conditions under which cars would be equipped will be contingent upon the action of the A.A.R. and the requirements of the U. S. Public Service at the time final report and recommendations are submitted.

(The report was presented by Chairman E. P. Moses, engineer of rolling stock, N.Y.C., the Joint Committee on Railway Sanitation comprising three representatives each of the A.A.R. Mechanical Division, Engineering Division, Medical and Surgical Section, and of the U. S. Public Health Service.)

The report was accepted.

JOINT REPORT—RAILWAY SANITATION

The Sanitation Research Project has been continued since the last report was made, under the direction of Dr. Abel Wolman, consulting engineer and professor of sanitary engineering, of Johns Hopkins University.

Investigation into the use of passenger-car toilet facilities and the nature and quantities of toilet wastes, as covered in Technical Report No. 3, has been supplemented during the past year by similar studies on transcontinental trains, including coaches, room type and open-section sleeping cars. These studies were conducted on trains

operating between Chicago and Portland, Chicago and Los Angeles, Washington, D. C. and Ft. Worth, Tex. Checks were also made of frequency of coach toilet use on short runs between Baltimore and Elkins, W. Va., via Hagerstown and Cumberland. The results of these investigations are included in Technical Report No. 4 recently distributed to member roads.

During the past year service tests were made of a grinder type disposal unit attached to women's toilet of Pennsylvania Coach 3829 in regular operation between Washington and New



An Erie freight train along the Delaware river west of Port Jervis, N. Y.

PURCHASES IN 4 MONTHS EXCEEDED A BILLION

Equipment orders, up 38 per cent from last year, instrumental in overall rise of 19 per cent from '47 totals

Despite the coal strike during part of April, which affected purchasing activities in many other items than coal, *Railway Age* estimates show that during the first four months of 1948 the Class I railroads of the United States spent more than \$252,000,000 per month for equipment, fuel and supplies, almost \$29,000,000 per month more than they spent for similar supplies and equipment in 1947. The increase in the buying of manufactured products was \$121,557,000, a rise of nearly 20 per cent from expenditures for like items in 1947.

Equipment orders have played an important part in this large rise in railroad spending. During April alone, an estimated \$85,000,000 was earmarked for new equipment. These orders include an estimated \$73,000,000 for 18,252 new freight cars, \$8,250,000 for 19 Diesel-electric and 12 steam locomotives, and \$3,750,000 for 36 passenger train cars.

All items in the *Railway Age* analysis of expenditures, with the exception of crossties, show an increase from last year. The results of a bad winter for the tie producers and a good export market are seen in this drop of 33 per cent.

1948 RAILWAY PURCHASES*

	April (000)	4 Month Totals 1948 (000)	4 Month Totals 1947 (000)
Equipment**	\$ 85,000	\$308,971	\$223,396
Rail	5,374	29,167	28,299
Crossties	5,550	20,904	31,666
Other Material	102,232	383,866	337,990
Total from Manufacturers	\$198,156	\$742,908	\$621,351
Fuel	56,524	265,587	226,257
Grand Total	\$254,680	\$1,008,495	\$847,608

*Subject to revision

**Amount placed on order

The effects of the coal strike are noticeable in both fuel purchases and inventories. The former declined 17 per cent from the March total and the latter dropped 1 per cent from the amount on hand March 1.

APRIL* PURCHASES OF MANUFACTURED GOODS (Excl. Equip. & Fuel)

April '48 Compared to Other Aprils (000)			April '48 Compared to Other Months '47 and '48 (000)			Four Month Totals '48 and Other Years (000)		
Year	Amt.	% Change	Month	Amt.	% Change	Year	Amt.	% Change
1942	\$ 78,378	+44	Jan. '47	\$ 97,962	+16	1942	\$308,053	+41
1943	67,218	+68	Feb. '47	88,748	+28	1943	250,453	+73
1944	82,257	+38	Mar. '47	100,398	+13	1944	329,297	+32
1945	84,137	+34	Jan. '48	102,510	+10	1945	321,609	+35
1946	84,686	+34	Feb. '48	100,083	+13	1946	298,322	+45
1947	110,847	+ 2	Mar. '48	118,188	— 4	1947	397,955	+ 9
1948	113,156		Apr. '48	113,156		1948	433,937	

APRIL* PURCHASES OF RAIL

April '48 Compared to Other Aprils (000)			April '48 Compared to Other Months '47 and '48 (000)			Four Month Totals '48 and Other Years (000)		
Year	Amt.	% Change	Month	Amt.	% Change	Year	Amt.	% Change
1942	\$5,827	— 8	Jan. '47	\$7,723	—30	1942	\$16,477	+77
1943	4,181	+29	Feb. '47	7,030	—24	1943	18,050	+62
1944	6,175	—13	Mar. '47	6,779	—21	1944	26,562	+10
1945	5,621	— 4	Jan. '48	7,252	—26	1945	23,848	+22
1946	6,207	—13	Feb. '48	8,041	—33	1946	15,388	+90
1947	6,767	—21	Mar. '48	8,500	—37	1947	28,299	+ 3
1948	5,374		Apr. '48	5,374		1948	29,167	

APRIL* PURCHASES OF FUEL

April '48 Compared to Other Aprils (000)			April '48 Compared to Other Months '47 and '48 (000)			Four Month Totals '48 and Other Years (000)		
Year	Amt.	% Change	Month	Amt.	% Change	Year	Amt.	% Change
1942	\$35,230	+60	Jan. '47	\$59,602	— 5	1942	\$134,097	+98
1943	48,369	+17	Feb. '47	55,651	+ 2	1943	179,091	+48
1944	51,655	+ 9	Mar. '47	58,539	— 3	1944	205,314	+29
1945	45,601	+24	Jan. '48	72,296	—22	1945	185,314	+43
1946	29,333	+93	Feb. '48	69,010	—18	1946	183,871	+44
1947	52,465	+ 7	Mar. '48	67,757	—17	1947	226,257	+17
1948	56,524		Apr. '48	56,524		1948	265,587	

*Subject to revision

APRIL* PURCHASES OF CROSSTIES

April '48 Compared to Other Aprils (000)		
Year	Amt.	% Change
1942	\$6,143	-10
1943	6,625	-16
1944	6,745	-18
1945	5,647	-2
1946	7,720	-28
1947	9,117	-39
1948	5,550	

April '48 Compared to Other Months '47 and '48 (000)		
Month	Amt.	% Change
Jan. '47	\$7,421	-26
Feb. '47	6,930	-20
Mar. '47	8,198	-33
Jan. '48	5,370	+3
Feb. '48	4,378	+27
Mar. '48	5,606	-1
Apr. '48	5,550	

Four Month Totals '48 and Other Years (000)		
Year	Amt.	% Change
1942	\$21,928	-5
1943	21,673	-4
1944	27,685	-24
1945	22,247	-6
1946	27,651	-24
1947	31,666	-33
1948	20,904	

APRIL* PURCHASES OF OTHER MATERIAL

April '48 Compared to Other Aprils (000)		
Year	Amt.	% Change
1942	\$66,409	+54
1943	56,412	+81
1944	69,337	+47
1945	72,869	+40
1946	70,759	+44
1947	94,963	+8
1948	102,232	

April '48 Compared to Other Months '47 and '48 (000)		
Month	Amt.	% Change
Jan. '47	\$82,818	+23
Feb. '47	74,788	+37
Mar. '47	85,421	+20
Jan. '48	89,888	+14
Feb. '48	87,664	+17
Mar. '48	104,082	-2
Apr. '48	102,232	

Four Month Totals '48 and Other Years (000)		
Year	Amt.	% Change
1942	\$269,648	+42
1943	210,730	+82
1944	275,050	+40
1945	275,514	+39
1946	255,283	+50
1947	337,990	+14
1948	383,866	

APRIL* TOTAL PURCHASES (Excl. Equip.)

April '48 Compared to Other Aprils (000)		
Year	Amt.	% Change
1942	\$113,609	+49
1943	115,587	+47
1944	133,912	+27
1945	129,738	+31
1946	114,019	+49
1947	163,312	+4
1948	169,680	

April '48 Compared to Other Months '47 and '48 (000)		
Month	Amt.	% Change
Jan. '47	\$157,564	+8
Feb. '47	144,399	+18
Mar. '47	158,937	+7
Jan. '48	174,806	-3
Feb. '48	169,093	-
Mar. '48	185,945	-9
Apr. '48	169,680	

Four Month Totals '48 and Other Years (000)		
Year	Amt.	% Change
1942	\$442,150	+58
1943	429,544	+63
1944	534,611	+31
1945	506,923	+38
1946	482,193	+45
1947	624,212	+12
1948	699,524	

APRIL* INVENTORIES OF RAIL

April '48 Compared to Other Aprils (000)		
Year	Amt.	% Change
1942	\$23,635	+55
1943	20,753	+76
1944	26,923	+36
1945	27,142	+35
1946	24,064	+52
1947	29,775	+23
1948	36,572	

April '48 Compared to Other Months '47 and '48 (000)		
Month	Amt.	% Change
Jan. 1, '47	\$30,192	+21
Feb. 1, '47	31,447	+16
Mar. 1, '47	31,217	+17
Jan. 1, '48	32,924	+11
Feb. 1, '48	36,120	+1
Mar. 1, '48	37,341	-2
Apr. 1, '48	36,572	

APRIL* INVENTORIES OF SCRAP

April '48 Compared to Other Aprils (000)		
Year	Amt.	% Change
1942	\$9,947	+59
1943	10,517	+50
1944	10,334	+53
1945	15,345	+3
1946	11,369	+39
1947	11,222	+41
1948	15,783	

April '48 Compared to Other Months '47 and '48 (000)		
Month	Amt.	% Change
Jan. 1, '47	\$12,572	+26
Feb. 1, '47	11,929	+32
Mar. 1, '47	17,017	-7
Jan. 1, '48	13,225	+19
Feb. 1, '48	13,336	+18
Mar. 1, '48	16,409	-4
Apr. 1, '48	15,783	

APRIL* INVENTORIES OF CROSSTIES

April '48 Compared to Other Aprils (000)		
Year	Amt.	% Change
1942	\$66,837	+45
1943	62,280	+55
1944	81,525	+19
1945	78,236	+24
1946	80,724	+20
1947	97,549	-1
1948	96,782	

April '48 Compared to Other Months '47 and '48 (000)		
Month	Amt.	% Change
Jan. 1, '47	\$83,891	+15
Feb. 1, '47	88,293	+10
Mar. 1, '47	92,861	+4
Jan. 1, '48	92,300	+5
Feb. 1, '48	93,492	+4
Mar. 1, '48	98,843	-2
Apr. 1, '48	96,782	

APRIL* INVENTORIES OF FUEL

April '48 Compared to Other Aprils (000)		
Year	Amt.	% Change
1942	\$41,372	+55
1943	50,330	+27
1944	49,938	+28
1945	52,313	+23
1946	48,993	+31
1947	51,207	+25
1948	64,153	

April '48 Compared to Other Months '47 and '48 (000)		
Month	Amt.	% Change
Jan. 1, '47	\$49,873	+29
Feb. 1, '47	51,164	+25
Mar. 1, '47	52,233	+23
Jan. 1, '48	66,388	-3
Feb. 1, '48	66,727	-4
Mar. 1, '48	65,071	-1
Apr. 1, '48	64,153	

APRIL* INVENTORIES OF OTHER MATERIAL

April '48 Compared to Other Aprils (000)		
Year	Amt.	% Change
1942	\$377,799	+55
1943	371,322	+58
1944	400,722	+47
1945	441,106	+33
1946	451,262	+30
1947	519,985	+13
1948	587,390	

April '48 Compared to Other Months '47 and '48 (000)		
Month	Amt.	% Change
Jan. 1, '47	\$476,625	+23
Feb. 1, '47	490,734	+20
Mar. 1, '47	498,159	+18
Jan. 1, '48	560,703	+5
Feb. 1, '48	570,201	+3
Mar. 1, '48	577,078	+2
Apr. 1, '48	587,390	

APRIL* TOTAL INVENTORIES

April '48 Compared to Other Aprils (000)		
Year	Amt.	% Change
1942	\$519,590	+54
1943	515,212	+55
1944	569,442	+41
1945	614,142	+30
1946	616,412	+30
1947	709,738	+13
1948	800,680	

April '48 Compared to Other Months '47 and '48 (000)		
Month	Amt.	% Change
Jan. 1, '47	\$653,153	+23
Feb. 1, '47	673,567	+19
Mar. 1, '47	691,487	+16
Jan. 1, '48	765,540	+5
Feb. 1, '48	779,876	+3
Mar. 1, '48	794,742	+1
Apr. 1, '48	800,680	

* Subject to revision



THE GENERAL COMMITTEE.—Rear row, left to right: V. N. Dawson, J. L. Quarles, H. M. Rainie, G. E. Wilson, N. V. Oldenbittel, C. B. Neubauer, C. L. Wakeman, A. L. Sorenson, C. H. Murrin, J. Timanus. Front row, left to right: E. J. Leonard, L. L. King, W. W. Kelly, H. E. Warren, vice-chairman, F. S. Austin, chairman, W. J. Farrell, executive vice-chairman, M. E. Townner, J. C. Kirk, J. S. Fair, Jr., and G. M. Betterton. Absent when the picture was taken were D. McK. Ford, F. C. Turner and J. H. Lauderdale.

PURCHASES AND STORES DIVISION SEEKS WAYS TO OFFSET RISING COSTS

H. E. Warren elected chairman at annual meeting, which heard carefully chosen addresses on outstanding problems and informative committee reports

The attendance at the annual meeting of the Purchases & Stores Division, Association of American Railroads held at the Palmer House, Chicago, June 28-30, was in excess of 400, not including guests for the proceedings. Frank S. Austin, manager of purchases and stores of the New York Central, the chairman of the division, presided throughout the meeting and was assisted by W. J. Farrell, executive vice-chairman. H. E. Warren, vice-president of the Gulf, Mobile & Ohio, was elected chairman for the coming year, and J. C. Kirk, general purchasing agent of the Chicago, Rock Island & Pacific, was elevated to the vice-chairmanship. New members elected to the General Committee were B. T. Adams, Illinois Central; G. T. Wickstrom, Union Pacific; Clyde Cocke, Norfolk & Western; G. A. Goerner, Chicago, Burlington & Quincy; A. L. Prentice, New York Central; and B. W. Roberts, Canadian Pacific.

Of more than usual interest were the addresses which were interspersed between the committee reports during the three days. These fall into two classes: (1) those from officers and directors of the A.A.R. and the Interstate Commerce Commission; and (2) those from authorities on the difficult problem facing the purchases and stores department. Abstracts of the addresses appear in these pages.

W. T. Faricy, president of the A.A.R., stated that the railroads were today in better shape than they were on Pearl Harbor day. They have more freight and passenger cars and more motive power. Speaking of railroad earnings, he observed that the trend was upward, in the right direction, but that they were still too low. "In 1946 we had 2.75 per cent, and it came up to 3.4 per cent last year. This year, if the present volume keeps up without any further changes in cost . . . we ought to make a return of 4.25 per cent. . . . We never intend to quit until we hit 6 per cent."

Robert S. Henry, vice-president, public relations, A.A.R. told the division that it was a "continuous battle to keep the public informed of railroad needs. At present the railroads must convince the public that "in order to meet expenses the rates must go up." Investment in plant and equipment for improvement is necessary and dollars are needed to carry on these activities. He said that the purchases and stores departments could do the best work in this field because of their contacts with the suppliers.

Commissioner William J. Patterson of the I.C.C. said he had been told at times, by operating people and others, that the purchasing department was too slow or sometimes refused to purchase proper materials to comply with commission orders. Time extensions on orders were sometimes necessary, but he did not believe that it was because the "purchasing department was too late or furnished too little." He felt, however, that a little better cooperation between, and coordination of, departments would produce a smoother operating machine. Such a condition would make possible "the easier and more satisfactory regulation" of the industry, from a public standpoint.

GURLEY'S TRIBUTE TO P. & S.

F. G. Gurley, president of the Atchison, Topeka & Santa Fe, said that the advent of railroads was the beginning of the era of prosperity for the United States. They must make the public understand this, and also understand that a fair return on investment is necessary. Six per cent is none too much, everything considered, and especially depreciation.

Increasing costs must be met, he said, through new business administrative techniques and the use of mo-

dern tools to mechanize operations. Especially in the latter of these two were great possibilities for the stores department.

Speaking of winning the public to the railroad point of view, Mr. Gurley considered the passage of the Bulwinkle Bill as a first step in that direction. In his opinion the shippers, regulatory bodies and public saw that this legislation was to their best interests. However, much work, on a long programmed basis, still is necessary.

With the breakdown of the Railway Labor Act Mr. Gurley saw an acute need for planning in the field of labor relations. He said that there had been some discussion of making the findings of a Presidential fact-finding board mandatory. While this would not be very popular anywhere, "I think that in a regulated industry it is a perfectly logical thing to anticipate, although I don't advocate it if restraint and good judgment and common sense can again be brought into this labor relations question."

"I don't suppose there is any group of people who do a greater job for their chief executives than you. I just don't know how I'd get along without the advice and the help and the suggestions that come to me from our purchasing department and our stores department. They are so much closer to the shifting facets of our economy and of our supply and demand that I just couldn't keep up without them. I think that is true of most presidents. I want to close by thanking you very much for what you have done for the executives of your industry, and to urge that you have faith in your industry and a devotion to the task to keep everlastingly at it, and if you can keep on doing as good as you have done, that will be a whole lot."

ENIGMAS IN STEEL—BATCHELLER

There are three factors holding up steel production, said H. G. Batcheller, president of Allegheny Ludlum Steel Corporation. They are: (1) inadequate metallurgical coal, and its quality; (2) the drastic scrap shortage, which last year lost us 3,000,000 ingot tons in production and promised even greater losses this year; and (3) a lack of high grade iron ore. The scrape shortage may be remedied by importation of German scrap, but the ore shortage may take some time. As to coal, only John L. Lewis knows the answer.

Continuing high demand for steel is due to: (1) mobilization for a possible third world war; (2) demand of other than war-ravaged countries; (3) war-deferred federal, state, and other public projects; and (4) the demand for consumer goods. Little decrease in demand is in sight. But by the end of 1949, 5½ million ingot tons will have been added to producing capacity, at a cost of \$1,700,000,000. Still no guess is possible on when there will be enough to go around.

Conservation is needed, Mr. Batcheller said. Corrosion of finished steel must be cut. "One authority has estimated that corrosion destroys, yearly, about two per cent of all steel in service. Another estimated that 40 per cent of all steel produced in 1946 was required to replace material which had failed in service because of corrosion."

On the railroads conservation can be furthered by: (1) the use of protective coatings; (2) careful lubrication of all moving parts; and (3) "learning the long-range economy of using better combinations of metals. High strength alloy steels many times are least expensive in the long run, despite initial cost."

Commenting on the Supreme Court's recent "Cement case" basing point decision, Mr. Batcheller said that if it stands, "each producer will have a virtual monopoly in the vicinity of his mill, since no other producer can systematically absorb freight in order to sell in that district. Manufacturers located remotely from their sources of supply will face the alternative of either moving their plants or suffering discriminating costs which will make them non-competitive."

AYDELOTT ON NEED FOR ADEQUATE REVENUES

Steel is still the most important supply problem of the Purchases and Stores Division and, therefore, of the railroads, A.A.R. Vice-President J. H. Aydelott remarked in his address. Since this commodity has remained in short supply, it has been necessary to continue the program of voluntary allocation which was worked out in conjunction with governmental agencies. The program proposes that approximately 250,000 tons of steel will be made available each month to permit the construction by the railroads and contract car builders of 10,000 new freight cars and to supply as well full M.R.O. requirements.

"The goal of 10,000 new freight cars a month was set about a year ago, but up to June 1 it had not been reached. During the first half of June, however, 5,186 new cars were turned out and this is most encouraging. As I told the House interstate and foreign commerce committee three weeks ago, I consider this goal too low, and believe that there should be a minimum of 12,000 new freight cars produced each month. The necessity for a larger program than 10,000 cars per month is clearly indicated by the small gains being made in freight car ownership. In the month of May the net gain was only 1,122 cars, since 8,257 were retired against new construction of 9,379 cars.

"Cooperation of governmental agencies will apparently be necessary in the case of forest products if we are to obtain adequate lumber and crossties for railroad use in the light of proposals to export huge quantities of ties under E.C.A. programs. The railroads are finding it difficult to purchase adequate supplies this year, probably due in no small part to the sale abroad of at least 6,000,000 ties last year.

"In view of the fact that the foreign aid program contemplates an export quota of up to 10,000,000 crossties in four years, it is essential that careful consideration be given by governmental agencies to our domestic requirements and exports to foreign countries limited to minimum requirements. Controls which effectively limit the export of crossties have previously applied only to treated ties. Untreated ties, however, have now been added to the 'positive list,' and are subject to limitations when shipped on export quotas.

"Last year, the purchasing departments of Class

I railroads spent more than two and a half billion dollars for equipment, materials, supplies and fuel. It has been estimated that the figure this year will be more than three billion.

"Because such a large proportion of railroad money is spent by those of you who are in purchasing and stores, perhaps no single group of railroaders should be more aware or have a better appreciation of the need for adequate revenues. The fact that material costs have increased steadily since 1939, and what the impact of these increases has been upon the railroad treasuries, are matters with which you are all familiar. Using crossties as an example, in 1939, ties cost 77 cents each, while today they cost \$1.77, or an increase of 130 percent. This increase, multiplied by the 44 million crossties which the railroads purchased last year, represents a huge sum of money.

"Rising costs of railroad operation can be measured by a weighted index of railroad wages, payroll taxes and material prices. The index of these three items was higher at the end of the last year than the average for 1946 by about 22 per cent. It was higher than in 1939 by about 80 per cent. This disparity has grown even greater in 1948. These sharp and continuing increases, which came during the war and since, alone have added three and a quarter billion dollars a year to railroad operating costs since 1939.

"In the same spread of years increases in rates and fares authorized by the Interstate Commerce Commission approximate only \$2,800,000,000 annually. Thus increases in charges as granted to the railroads leave their gross revenues still \$450 million short of meeting the increased costs of wages, materials, payroll taxes and fuel. There is a limit to which our rate structure can be increased lest we price ourselves out of the transportation market. It is hoped that the future may promptly and properly establish the railroad industry on an earnings basis that will insure that they will be ready for any demands which the country in peace or in war may make upon them."

OUTLOOK FOR PETROLEUM FUELS

In the minds of railroad men, said W. W. Kelly, general purchasing agent of the Santa Fe, the words "petroleum products" raise, among others, two questions, namely: (1) Where will the price increase stop; and (2) will there be sufficient production and refining capacity to meet the future demands for petroleum products?

"On the railroads, the major petroleum products used are lubricants, gasoline, and fuel oils, both residual and Diesel. Gasoline is an important requirement for railroads but we use only a small portion of the total output as compared to automobiles, trucks, buses, and airplanes.

"If the refiners' scramble for business means anything, there are plenty of lubricants available, with no shortage in sight. Much benefit, however, would result if some satisfactory and common specification were developed to make lubricating oils compatible and allow their mixing.

"Residual fuel oil is largely a problem of the Southwestern and Western railroads. In the early days and before modern refining methods, a necessity of a suc-

cessful refinery was getting rid of the residual fuel oil. The railroads were one of the main buyers. More efficient methods of refining, reducing the proportion of residual fuel made, together with increased industrial consumption of residual fuel oil, now have balanced supply and demand. It seems to me, however, that the demand of railroads for this type of fuel will decrease in the future and help eliminate shortages for railroads.

"Diesel fuel oil is, I believe, the petroleum angle uppermost in our minds. The rapid growth of Diesel locomotives on railroads has created a number of important problems. One of the most important is assurance of an adequate supply of proper fuel.

"Obviously, there is some point of saturation, where additional purchases of Diesel engines, for railroad use, will be in the nature of replacement. This seems to be well into the future, since financing, engine manufacture, the prevention of maintenance failures, and the training of personnel to handle this new type of power, are activities requiring time for proper balanced development. In the meantime, however, the new engines appearing in road service almost daily must have their quota of fuel.

"Railroads commenced to use Diesel power in the late 30's, and on December 31, 1940, there were in service 967 units, and by December 31, 1947, about 6,100 units. The average increase from January, 1941, through 1947 would be 733 units per year. At the same rate, six years hence there would be in service something like 10,000 units. (This is not a prediction.) However, about 1,100 units were placed in service during 1947. Since all Diesel engine manufacturers have a large backlog of orders, it is probably safe to assume, depending on need and ability to finance the acquisition of engines, railroads may place in service around 1,800 units per year.

"The railroads consumed some 60,600,000 gallons of Diesel fuel oil in 1940, and 733,000,000 gallons in 1947. The increase in 1947 over 1946 was 219,400,000 gallons. I think there is no question but that this increase will be a most conservative estimate for an anticipated future yearly increase.

"With this increased demand for fuel oil, there have arisen problems connected with suitable quality. Fortunately, the operating experience gained in road service and the cooperation of engine manufacturers and oil companies strengthened our position. In the beginning of any major change such as this revolution in power application by railroads conservative practice and common sense dictate the use of products considered desirable for the toughest operation. It was necessary to operate thousands of miles and carefully compare performance records on a variety of fuels in order to establish minimum requirements which might open up future sources of fuel supply. As a result, the acceptable cetane requirement is now lower than a year or two ago. However, it is 9,000,000 gallons daily, or 214,300 barrels, which is five times the amount actually used, but is less by 537,000,000 gallons than the combined amount of Diesel and residual fuel consumed in 1947, and less than the 283,000 barrel daily increase, during the same year, of just one of the other users—home heaters.

"Fuel cost is the largest single item of railroad operating expenses. The cost of petroleum fuel is directly based on the price of crude oil. Recently, the

reason given for a substantial increase in crude oil prices was to correct and put above board premiums in excess of posted prices which were being paid by some refiners for crude oil. The increase, as nearly as I can learn, did not correct the evil, and now we hear rumbles of another corrective increase. Probably it also would not correct the situation, and again, only tend to increase railroad operating costs and add to the spiral of inflation.

"The common objective of obtaining increased amounts of fuel to keep pace with railroad demands is closely allied with the basic aspects of our peacetime economy, as well as the possibility of a national emergency. The railroad Diesel engine is vital in either set of circumstances. The continued use of efficient low-cost power by railroads is of paramount importance to our national economy. It thus follows that all industry has much to gain in taking necessary steps to insure a volume, and quality, of fuel which will enable the railroads to continue their program of transporting national requirements faster and more economically."

CHAIRMAN AUSTIN'S COMMENTS

Chairman Austin said that the division had been most helpful in having the railroads adopt the Standard Material Classification, the Classified Material Balance Report, the Railroad Scrap Classification, the standard invoice and the Purchasing & Stores Manual.

"During this post war period the purchasing and stores departments are weathering probably the most difficult period in their existence," he remarked. "There has been no time in my experience that matches the present as regards uncertainties of price and difficulty of procurement. There were times when contracts could be signed and forgotten, but not so during this period. Practically every contract has come up for revision of some kind. Intermittent strikes in coal and steel have upset our railroads probably more than industry in general, interrupting the steady flow of material to our shops, causing limited output in some cases and complete shut down in others.

"You are all familiar with the difficulty in the procurement of steel for the construction of 10,000 freight cars per month and for M.R.O. With the acceptance of the Voluntary Plan No. 1 it is felt that government control of this important item will not be necessary. Our executive vice-chairman has been a tower of strength in Washington through all these months in helping to bring about the final acceptance of this voluntary plan. His office has also been of assistance, including the drive for railroad scrap, and the crosstie situation.

"Much new equipment has been purchased since V-E Day, including locomotives, passenger train cars and freight cars. There has been a terrific change-over from steam to Diesel, adding thousands of new items to our stock books and forcing those handling the repairs to arrange for new shops and new storehouses. There have been also many new items added

because of new specialties added to our modern passenger equipment. My people tell me that our stock items have increased by some 40 per cent since 1940.

"There are a number of commodities and other matters which are giving concern to the members of our division, and we have arranged to have speakers on five important subjects, which I believe will give us a better understanding of these problems than we now have.

"The number one problem has been that of securing sufficient steel for maintenance, repair and operation (M.R.O.) and for the production of 10,000 new freight cars per month. The number two problem has been the securing of sufficient Diesel fuel for our new type of motive power, Diesel-electric locomotives. Number three problem has been in getting to the steel companies sufficient steel scrap. . . . The number four problem, namely the efficient handling of railroad material mechanically, will be dealt with. The number five problem has been one of invested capital in material stocks. Our inventories or material stock balances have increased greatly since 1940. One of our members will explain some of the factors causing the present balance to be so much higher than in 1940."

SCRAP NEEDED BADLY, SAYS GREEN

Congratulating the railroads on the success of their April scrap drive, L. D. Green, consultant on scrap of the American Iron & Steel Institute, suggested that with the scrap market at an all time high and with everyone "bullish," the thing to do if one had scrap was to sell it. "No one has . . . ever gone broke in taking profits." He further urged the roads not to hold off selling scrap simply because their own scrapping facilities might not be able to take care of all the handling that had to be done. "We need that scrap," and scrap operators can handle it.

In the general situation he found that the present war scap had retarded government scrapping operations. The best prospect for more scrap, he said was to be found in what we could get from abroad, especially from Germany, where there was available a reported 10,000,000 tons.

ADAMS ON MATERIAL HANDLING

It has been said by some authority on the subject that from the beginning of the manufacture of a piece of material until it has been finished and placed in the service for which it was made, a sum equal to 45 per cent of its value has been spent in handling it. B. T. Adams, general storekeeper of the Illinois Central, used that statement to emphasize the importance of material handling not only on the railroads but in all industries.

"The figures submitted to this division as of December 31, 1947, showed that 107 railroads reported a to-

(Continued on page 146)

COMMITTEE REPORTS

OF THE PURCHASES AND STORES DIVISION

REPORT OF THE GENERAL COMMITTEE

The chairman had appointed the following as members of the Committee on Committees for the past year: H. M. Rainie, chairman, J. C. Kirk, W. S. Morehead, and A. L. Sorenson.

This committee held two meetings during the year. Complete assignment of personnel for appointment to subject committees was made and all committees were appointed early in October, 1947. The Committee on Committees also included several fundamental suggestions for action by the various subject committees.

The activities of the Committee on Committees for this year was increased considerably in view of the suggestion made at the 1946 annual meeting that semi-permanent subject committees be established with membership changed on the basis of 25 per cent per year, in order that full and complete consideration might be given to the subject in question and so that the continuity of the committee activities may be maintained. This recommendation was modified to some extent by the General Committee to a three-year plan, which is in effect at the present time; and it will be further perfected with the appointment of the committees for the ensuing year.

It is the opinion that this plan has merit and will be of great advantage to the division in that it will provide greater continuity of action and particularly during the interim between the annual meeting and the report of the current Committee on Committees.

Cooperation with Governmental Agencies.

—It was necessary, due to the continued shortage of materials, particularly steel and crossties, that contacts with governmental agencies be continued. This has been an important activity of the executive vice-chairman throughout the year. Under the voluntary program with respect to the critical shortage of freight cars, quarterly schedules of new freight cars to be built in railroad and private line shops, with steel tonnage requirements for such schedules as well as M.R.O. repair steel, are obtained from the railroads and presented to the O.D.T. for presentation to its Steel Task Committee. The tonnages thus agreed to by

the steel companies, through the Steel Task Committee, are then transmitted to the railroads by the O.D.T., through the executive vice-chairman's office.

As a result of the passage of Public Law 395, the Department of Commerce was designated by the President to supervise the steel requirements for new freight cars and repair steel. The law was effective on April 1, 1948, and it was understood that the provisions of the Voluntary Plan No. 1, covering steel and pig iron for the construction of domestic railway freight cars and the repair of railroad rolling stock, would continue to be handled through the O.D.T., as in the past. As a result of a public hearing, held on March 19, 1948, by the Department of Commerce, the voluntary plan under Public Law 395, is in effect. Delegation of authority to the O.D.T. under this law has been made by the Department of Commerce. For the purpose of general supervision and representation of the railroads and private car lines, the former O.D.T. Railroad Advisory Committee has been enlarged. Quarterly meetings are being continued under the direction of the O.D.T., as in the past.

As indicated in the report of our Forest Products Committee, the question of increasing the export quota of cross ties has been an important subject of consideration during the year. A subcommittee of the Forest Products Committee attended a joint conference in Washington with the government agencies and presented facts in relation to the essentiality of conserving cross ties and lumber for domestic use prior to increasing export quotas, in view of the prevalent shortage of cross ties in this country during the past fiscal year.

In accordance with the Rules of Order, the committee has designated the following as members of the Committee on Nominations for this year: A. W. Munster, (chairman), vice-president, Boston & Maine; E. H. Polk, purchasing agent, Southern Pacific; E. A. Busk, general purchasing agent, Chicago & North Western; M. E. Baile, general storekeeper, Missouri Pacific; W. L. Oswalt, stores manager, Pennsylvania.

The following committee was appointed to supervise the annual essay contest during the past year: V. N. Dawson, (chairman) W. W. Kelly and N. V. Oldenbittel.

Regional Group Meetings.—Our regional group committees have continued their activities and some interesting meetings have been held during the past year. With the exception of one of the regional groups, at least two meetings have been held by each group. The meetings have been well attended and beneficial results have been obtained, particularly with respect to our subject committee contact representatives. This procedure is increasing in the results obtained and it was particularly emphasized during the past year at many of the group meetings.

At the request of the Accounting Department of the A.A.R. and the Bureau of Railway Economics, a suggestion was advanced with reference to a reappraisal of the Price Index. The General Committee appointed a subcommittee to confer with the Accounting Department and the bureau on this subject and the matter is progressing. The subcommittee appointed consists of: J. S. Fair, Jr., (chairman), G. A. Goerner, J. C. Kirk and W. W. Kelly.

The subcommittee has advanced the matter to the extent possible at the present time and this will be handled to a conclusion as soon as the situation is more propitious, primarily in relation to the constant change in market conditions.

Purchasing representatives on the General Committee are: F. S. Austin (chairman), mgr. p & s., N.Y.C.; G. M. Betterton, g.p.a., S.P.; J. S. Fair, Jr., p.a., P.R.R.; W. W. Kelly, g.p.a., A.T.&S.F.; L. L. King, g.p.a., I.C.; J. C. Kirk, g.p.a., C.R.I.&P.; J. H. Lauderdale, g.p.a., M.P.; H. M. Rainie, p.a., B.&M.; M. E. Towner, g.p.a., W.M.

Stores representatives are: H. E. Warren, (vice-chairman), v.p., G.M.&O.; V. N. Dawson, genl. stkpr., B.&O.; D. McK. Ford, v.p., C.N.R.; E. J. Leonard, genl. stkpr., C.N.&W.; C. B. Neubauer, asst. to v.p., Sou.; N. V. Oldenbittel, genl. stkpr., A.C.L.; J. L. Quarles, supt. stores, C.&O.; F. C. Turner, genl. stkpr., N.P.; C. L. Wake-man, genl. stkpr., Wab.; G. E. Wilson, mgr. stores, Rdg.; W. J. Farrell, exec. vice-chairman, P.&S. Divn., A.A.R.

LOSS AND DAMAGE PREVENTION— SALVAGE AND DISPOSITION

The General Committee indicated that the activities of this committee during the present year consist primarily of concentrating on the Manual Rules. The purchasing and stores department activities in buying, selling, shipping, receiving and handling material, supplies and equipment, are such that it is in a position to be of great aid to the freight claim and claim prevention departments. Our familiarity with material specifications, as well as our contact with the test and the using departments of the railroad, should be used to full advantage by the freight claim prevention officer. Further, we

should offer assistance to the freight claim prevention officer, particularly where damage has been done to a shipment and repairs can be accomplished, when acceptable to the customer.

(A new manual rule incorporating the latest packaging practices was attached.)

Following are the members of this committee: W. F. Brown (chairman), supt. scrap and recl. Wab.; W. J. Georgius, frt. sales agt., B.&O.; N. R. Hamilton, divn. stkpr. C. of Ga.; J. L. Layton, stores inspr., P.R.R.; A. B. Perkins, supt. reclamation plant, I.-G.N.; H. M. Rainie (chairman ex-officio), p.a., B.&M.

SCRAP, HANDLING AND PREPARATION, CLASSIFICATION AND SALE

The demand for all kinds of railroad scrap continues to be very heavy. In fact, the deliveries of new steel and steel products which the railroads hope to receive during the next 12 months depend to a large extent on the amount of scrap which the mills secure. Therefore, in order to secure the steel needed by the railroads for new rail, equipment, structures, maintenance and repairs, it is necessary for us to continue our efforts to produce as much scrap as possible from repair and replacement programs, retirement of obsolete equipment, rail structures, etc., and from material stocks that have become obsolete and unfit for other use.

Handling Centralized vs. Point of Origin.

—That there is an opportunity for the economical handling of some scrap at point of origin is indicated by the fact that most roads represented on the committee sell wheel-shop scrap (car wheels, axles and turnings) and some rail from point of origin. It is possible that this procedure can be extended with economy, especially on railroads having large manufacturing or repair plants at various locations, which produce in 30 days or less a carload of scrap which requires no further sorting. Scrap flues, cut-up firebox scrap, driving wheels tires and heavy melting steel may come under this head.

It is recommended that each road study its individual conditions, taking advantage of any opportunity for economical handling of scrap at point of origin.

Exhibits A and B provide a measuring stick which, when applied to conditions prevailing on any road, should

enable one to decide the most economical method of handling scrap on that road. Individual conditions, such as a very long line of road, desirable markets at opposite ends of line, location of shops, etc., may make more than one central plant desirable. But it is evident that the greatest benefits accrue when all miscellaneous scrap (other than the items mentioned above) is handled through one central plant.

Exhibit A—Why handle Scrap at Central Plant?

[This is a summary of important points made by the committee.]

1. The scrap plant usually is large enough to warrant a force of men thoroughly trained to handle it efficiently. If scrap operations are smaller, scrap is generally handled by any help

that is available and the work will not be done efficiently, resulting in improper grading of scrap and loss of usable material.

2. Duplication of facilities and local supervisory forces are avoided.

3. One large central plant provides sufficient volume to warrant the most efficient equipment and facilities and requires minimum equipment.

4. One plant permits all scrap handling and scrap handling practice to be uniform; it also requires a minimum of scrap tied up in process of production and in storage waiting to accumulate a carload.

5. A central scrap plant provides an excellent place to ascertain what equipment parts are furnishing the service expected of them and what parts require redesigning in order to obtain proper service from them.

6. Excessive scrapping of usable materials by the using departments can be detected at a central plant and the supervisors responsible at the offending points can be contacted so that this wasteful practice will be corrected.

7. The reclamation plant usually can be located adjacent to the scrap plant, eliminating excessive handling of reclaimable material and permitting proper control and quick distribution of items reclaimed. It permits checking of purchase orders against available supply and reduces purchases.

8. Scrap can be cleaned up currently from production operation.

9. It requires a minimum number of cars under load or held for loading, and reduces car miles in scrap handling.

10. It requires the minimum number of men assigned to handling and preparation of scrap.

11. It requires a minimum amount of trackage and dock space for sorting.

12. It requires minimum expense for maintenance of facilities.

13. It inspires men in the organization to produce maximum savings because of their jobs depending on their efforts.

14. It allows the concentration of accounting and scrap records, permitting current and correct charges and control of economical operations.

15. It permits prompt removal of scrap from shops and around mechanical department facilities where the space can be used more advantageously for repairs to rolling stock rather than for storing or preparing scrap. It eliminates the necessity of sorting and separation space at shop point.

16. It permits better control of scrap sales.

17. It eliminates the necessity of making scrap sorters or scrap inspectors out of mechanics, foremen, track supervisors, and others who can be used to better advantage elsewhere.

Exhibit B—Handle Scrap at Point of Origin

1. It reduces handlings of scrap by eliminating the loading of unprepared scrap and shipping it to a central plant where it is necessary to unload, prepare, and reload.



A. T. Kipping,
Chairman

2. It also enables shipping to closest market which in many cases reduces car miles.

3. Mechanical men and roadway men with experience are available to separate usable material from the scrap.

4. It permits a quicker turnover and keeps scrap cleaned up, reduces number of cars handling scrap, which reduces switching, train haul, and back haul.

Improved Handling of Scrap

The committee calls attention to the fact that with a rapidly changing market the amount of preparation that can be done economically will vary from month to month. Therefore, it is necessary constantly to check market prices and labor costs to know what can be done at a profit.

In sorting line of road scrap one road uses the following process:

1. At main scrap dock small material is allowed to work to bottom of pile.

2. Then picked up by magnet, taken to a chute, and allowed to gravitate to an enclosed sorting table. Here usable material sorted into lift truck skids and scrap goes into a narrow-gage car and is taken away for loading.

Advantages of this system are that work is done at waist height, with an increase in sorters' efficiency of approximately 150 per cent and the scrap dock is available for re-use in 75 per cent of ordinary sorting time.

On another road shop scrap is loaded into skids (first class per skid) and moved by lift truck to proper bin at scrap dock. Once bins are full a car is loaded by use of magnet.

Another road reports the installation of a breaker for converting large cast scrap into No. 1 cast; also use of a gas process for separating ferrous from non-ferrous metals, when cast integrally or of composite assembly.

One road reports improved methods of melting babbitt from scrap journal bearings and cleaning of brass by motor driven brush as it comes from the furnace.

Conforming to Specifications.—The importance of proper sorting and preparation of scrap to conform to specification cannot be overemphasized; first, so as to avoid rejections and depreciations in the value of railroad scrap; second, to bring the largest return to the railroads for the scrap which they sell. We recommend that each railroad check into its present method of sorting and preparing scrap and assure itself that no practices are in effect that do not conform to the specifications.

Claims on Scrap Shipments.—A study of these answers indicates that there is a tendency toward larger claims and a higher ratio of claims on roads that do not light-weight cars. We believe that claims for shortages in weights of scrap shipments should receive serious attention; as, if it becomes general knowledge that the railroads cannot substantiate their weights, the situation will probably grow worse and may re-



Railroad scrap plays a large part in keeping steel mills going in these days of great demand for steel products

sult in a substantial loss to the railroads. We recommend, therefore, that:

1) Sworn weighmasters be used.

2) Sufficient check weights be made to know that weighing is accurately performed.

3) Every reasonable care be taken to eliminate loss of scrap enroute, as well as to exclude wood, dirt, or other items or practices that may cause claim for shortages in weights.

4) Investigation of a discrepancy of 1,000 lb. or more in weight should be made before the car is unloaded or before the empty car is removed from the purchaser's yard.

The members of the committee are as follows: A. T. Kipping (chairman), supv. scrap and reclamation, C.R.I. & P.; R. E. Godley (vice-chairman), supv., scrap and reclamation, I.C.; D.

C. Canavan, gen. foreman, reclamation plant, B. & M.; J. J. Collins, supv., scrap and reclamation plant, Erie; J. H. Lau, scrap and old materials clerk, W.M.; W. F. Lawson, supt, reclamation plant, St. L.-S.F.; C. R. Littler, asst. p.a., E.J. & E.; Thomas McArthur, gen. foreman, reclamation plant, N.P.; W. G. Muschler, supt., reclamation and scrap, C.B. & Q.; C. E. Reasoner, asst. gen. stkpr., M.-K.T.; C. H. Rothgery, reg. stkpr., B. & O.; L. L. Stüder, dist. stkpr., M.P.; Otto Tiderman, stkpr., K.C.T.; J. N. Wandell, trav. stkpr., C.M.St. P. & P.; C. S. Wetherholt, div. stkpr., C.M.St. P. & P.; G. M. Wright, Mgr. scrap and reclamation, N.Y.C.; J. Young, asst. p.a., P.R.R.; P. Young, supv. reclamation, A.T. & S.F.; J. C. Kirk (chairman ex-officio), g.p.a., C.R.I. & P.

PURCHASING AND STORES DEPARTMENT MANUAL—RECOMMENDED RULES AND PRACTICES

Recommendations of this committee are as follows:

(1) We again recommend that separate Manual rules be prepared for the following:

Subject 3 Scrap-Handling, Preparation, Classification and Sale

Subject 3A Reclamation of Material

Subject 5 Forest Products

Subject 21 Equipment and Supplies for Dining Cars, Hotels and Commissaries

(2) Rule 14—Inventory—We suggest Subject Committee 4 properly explain the purpose of Form P&S 150, Section 4; which we believe is only for information as a suggested form

(3) The committee did not follow the

suggestion of Committee, Subject 9, that Rule 11, Section 9, be revised so as to be included in a general manner in this rule. It is our opinion that residual fuel oil and Diesel fuel oil are of such importance that separate sections covering contracts, inspection, distribution, storage, etc., of these important commodities be included in Rule 11.

(4) Attention is directed to past subject committee reports on Subject 23—Conservation of Materials, and Subject 29—Exchange of Materials, for which we have been unable to find rules in the Manual and it is suggested these committees consider preparation of such rules.

(5) Subject Committee 34, in its 1947 report, suggests that there are Manual

corrections and changes that should be made, but because of the cost of printing revised sheets no changes were recommended.

Your committee recommends that Committee on Subject 34 reconsider this subject and make recommendations for important Manual changes, if necessary, as we believe cost of printing is not the primary issue.

(6) Subject Committee 37, in its 1947 report, included an organization chart for the stores department. The Manual already includes such organization chart on page XXIII. In view of the fact that the report of Committee 37 was approved by our Division in 1947, Committee on Subject 37 should reconsider this chart and make recommendations for Manual change, if such change is desired.

(7) It is the recommendation that Committee Subject 1 be given authority to make corrections and additions to

the Manual (approved at the annual meetings) immediately after each annual meeting, so that approved changes to the Manual can be issued and be in the hands of newly appointed committees before they start their current year's work.

The members of the committee follow: J. W. Hagerty (chairman), asst. p.a., P.R.R.; S. D. Sneddon (vice-chairman), mgr. stores, C.N.R.; G. P. Bier, asst. to dir. p. and s., I.C.; D. E. Cain, ch. clerk to gen. stkpr., A.T.&S.F.; G. A. Goerner, gen. stkpr., C.B.&Q.; A. N. Laret, gen. p.a., St.L.-S.F.; C. F. Longsdorf, gen. stkpr., N.Y.C.; E. W. Walther, asst. p.a., B.&O.; A. W. Westerhaus, asst. p.a., T.&N.O.; H. E. Warren, (chairman ex-officio), v.p., G.M.&O.

Discussion: C. B. Neubauer, Sou., W. S. Morehead, I. C., and G. A. Goerner, C. B. & Q., urged its study and use once brought up to date.

THE FOREST PRODUCTS SITUATION

Lumber and crosstie supplies generally are still tight and prices remain high

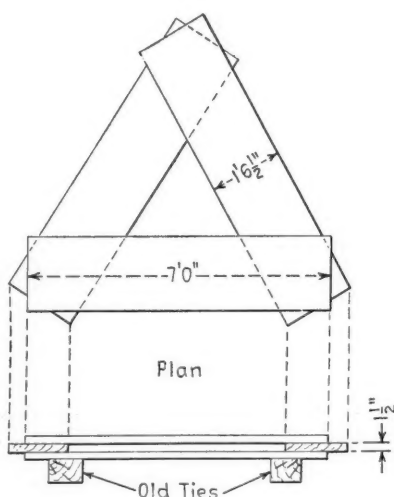
Production of crossties and lumber is still not in excess of demands. In the Northwest, where Douglas fir ties are in direct competition with lumber, the situation is further aggravated by the export demand. In the Northwest, much smaller quantities of crossties are being produced than are required, and there seems to be only one alternative there; that of controlling exports—since it is in that area that the export demand is most active.

The Office of International Trade of the Department of Commerce, having been approached with a request for an increase in the quota of treated ties for export, called on the Office of Defense Transportation for information as to the position of the railroads. Interested government agencies and railroad representatives for this division met in March of this year. It was brought out that there was a prospective shortage of crossties in the United States available for 1948 maintenance; that it was known that at least 6,000,000 crossties were exported in 1947; that the foreign nations were endeavoring to purchase oak and fir ties, largely untreated, and were suggesting that the United States use undesirable species and substitute treating agents. It developed that untreated crossties were not on the "positive list," or were uncontrolled for export.

The representatives of the railroads took the position that consideration be given to the control of untreated crossties for export, and that the quota for treated crossties be limited to actual requirements and not exceeding the original amount contemplated under the

European Recovery Program, in order to protect standard domestic requirements.

A recent development is the A.A.R. approval of a joint research program, to be carried out under the direction of our Engineering Research Department and the National Lumber Manufacturers Association, to study ways and means of reducing the checking and splitting of oak crossties and other hardwood species. The expense of the study will



Note:

1. Use old Grain Doors first.
2. Do not pile new Grain Doors on old.
3. Use old ties for bearings under Grain Doors.

Plan for storage of grain doors

be shared equally by the two organizations.

The committee makes the following recommendations on questions submitted to it.

Question 1. Use of treated material for repairs to foreign line cars. Recommended that this question be referred to the Operations and Maintenance Department, Mechanical Division.

Question 2. (a) Adoption of association standards for finished lumber—particularly items of 1 in. thickness. Recommended continued use of American Lumber Standards.

Question 2. (b) Adoption of finished size of 1 1/4 in. thickness for decking for closed cars. This not a question for this committee's decision, and it is recommended that it be referred to the Operations and Maintenance Department, Mechanical Division.

Question 2. (c) Adoption of 25/32 in. finished thickness for car siding in place of former standard of 13/16 in. In view of the fact that this finished thickness of 25/32 in. was approved by the A.A.R. and is now commercial practice, continued use of this thickness is recommended.

Question 3. Suggested action be taken by railroads to protect the supply of forest products. Recommended that this association, and the members thereof as individual railroads, make it a continuing practice to vigorously support qualified national, state, and local organizations and groups in efforts to conserve and restore our forests. This association is presently contributing to the support of a national organization with a program consonant with these aims. Failure to continue to work for forest conservation jeopardizes not only the railroads' supply of crossties, switch ties, timber, piles, poles, and lumber, but also their revenues from products of forests.

Question 4. Separate manual rules to cover subject of forest products. Recommendations were appended to the report.

Question 5. Development of improved practices in purchasing, handling, conservation and distribution. (a) Purchasing. Recommended that each individual road carefully consider the appointment of a Committee of its personnel, representing engineering, mechanical, purchasing and stores departments to meet periodically and consider problems involved in purchase and use of forest products.

(b) Handling. Recommended that individual member roads carefully consider the use of mechanical devices for handling lumber and other forest products.

(c) Conservation. Recommended study by individual roads of means to conserve lumber and forest products. See Question 3.

(d) Distribution. Recommended this subject be carefully considered by member roads as their individual needs may dictate.

In summation, it was the consensus

of the committee that the questions propounded under the four headings in Question 5 would vary so widely in the incidence of their application to each individual member railroad that they could best be answered satisfactorily by each road, and that the best method for each road to arrive at a proper conclusion was through the suggested committee of its own personnel, which would be advised of the problems peculiar to that road.

Question 6. Stacking of grain doors. The drawing shows details of method of stacking grain doors in storage. The committee concurs in recognizing the merit of such piling and commends it as recommended practice where conditions warrant.

At the same time the committee urges the use of older doors first, and the use of "one use" barricades where economy is proven.

Question 7. Participation in expense of independent inspection bureau, to serve car builders and lumber manufacturers. Recommended that the association refrain from participation in the expense of, or membership in, such a bureau.

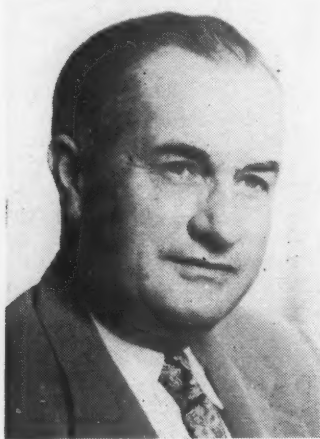
Question 8. Mechanical handling equipment. Recommended that careful study be given to the use of the various types of mechanical handling devices on the market today.

The committee members are as follows: W. F. Dunn (chairman), tie

and timber agt., Sou.; C. S. Burt (vice-chairman) mgr., forest products, I.C. Group I (Eastern-Southern): J. S. Eaton (chairman), lumber agt., W.M.; R. W. Cook, ch. tie and timber agt., S.A.L.; W. T. Cyphers, tie and timber agt., D.L. & W.; W. E. Evans, gen. tie and timber agt., C.N.R.; W. M. Hinkey, lumber agt., B. & O.; T. P. Lynch, asst. g.p.a., N.Y.C.; L. E. Peever, gen. tie and lumber agt., C.P.R. Group II (Mid-Western): M. B. Moore (chairman), asst. g.p.a., C. & N.W.; J. R. Cade, asst. p.a., T. & N.O.; G. B. Campbell, tie and timber agt., N.P.; J. E. Houghton, tie and timber agt., M.K.-T.; L. W. Kistler, supt. treating plants, St. L.-S.F.; E. C. Thom, lumber buyer, C.R.I. & P.; P. E. Turner, lumber agt., A.T. & S.F.; F. W. Woodruff, timber and treating inspec., E.J. & E. Group III (Far Western): E. J. Clark (chairman), asst. p.a., C.B. & Q.; C. S. Finlayson, asst. to ch. pur. off., C. M.St. P. & P.; L. V. Guild p.a., U.P.; L. S. Myers, asst. p.a., N.P.; E. H. Polk, p.a., S.P.; E. R. Teepell, western rep., pur. dept., Fruit Growers Express; L. L. King (chairman ex-officio), g.p.a., I.C.

J. S. Fair, P.R.R., said that the latest advice from Washington was that controls would keep purchases of ties in any one area at any one time from being too heavy, and that the railroads should make out fairly well.

CONSERVATION IN THE LIGHT OF IMPROVED METHODS AND RESEARCH



N. B. Coggins,
Chairman

It appears that radiant heating has proven economical and satisfactory and it seems to have a very definite place in railroad buildings, particularly in enginehouses, shop buildings and pas-

senger stations. The installation of this type of heating provides for a more uniform distribution of heat without drafts and permits the maximum utilization of floor and wall space by the elimination of radiators and other heating equipment. Another benefit is reduction of cleaning costs because heat streaks and dust deposits on interior surfaces are reduced.

A loop-type plastic clamp in a wide range of stock sizes is now being used. Advantages indicated are greater tensile and impact strength unaffected by atmospheric conditions. Non-corroding and non-sweating eliminates need for lock washers as screws lock firmly and can be reused over and over again. Uses include: signal terminal boxes, telephone wiring, electrical equipment wiring, copper tubing and rubber hose mounting.

Corbide Turning Tool.—The committee finds that a carbide turning tool has been recently developed. Very little detailed information is available. It is understood that tests have been by the automotive industry with satisfactory

results. The tool consists of a round slug of carbide held in the end of an especially designed tool holder. The automotive industry have used it in turning various parts; another manufacturer has been using it for boring larger diameters.

Expanded use of stainless steel and other alloys in railroad maintenance amplifies the need for high speed drills for such metals. The industry is reported to be making progress in the development of drills to meet the problem satisfactorily.

Some manufacturers are in a position to do flameproofing to upholstery fabrics, but others discourage this treatment. It is claimed that any process which assures permanence of treatment is apt to change the color and feel of the material. We understand that most of the presently available flameproofing compounds which do not affect the material are water-soluble and as a result are immediately removed when the material is washed or otherwise cleaned.

Generally speaking, it is not considered necessary to treat fabrics made of animal fibers, such as wool and mohair, as these in themselves are fire-resistant and will not support combustion.

Threadless Pipe and Fittings.—Previous committee reports made reference to the use of threadless fittings in joining all sizes of non-ferrous pipe and fittings used in low pressure installations and the use of butt-welded pipe fittings.

This method has been extended to include steel pipe and threadless malleable iron and other fittings for connecting black steel and wrought iron pipe. It is claimed that ferrous pipe joined by such a method is thus streamlined and has the low-friction loss advantages of copper tubing and a substantially lower cost and at no higher cost than threaded installations.

According to the Iron & Steel Institute the basic advantages are as follows:

- Reduction in wall thickness and pipe weight.
- Simplification in making joint. Skilled labor to cut threads not necessary.
- Elimination of thread does away with a common point of pipe failure.
- Pipe can be fitted up against a wall and used where it would be impossible to use a wrench.
- Smooth internal passage results in a sharp reduction in friction loss.
- Disconnection of pipe lines simplified. By heating the joint 12 deg. higher than when making the joint, solder will flow freely from the joint.
- Resulting pipe joint is stronger than the pipe or fitting.
- Joint has greater ability to withstand vibrations than threaded joints.

Such fittings are now being produced up to and including 2 in. size and are applicable wherever 150 lb. standard weight black, malleable, screwed fittings are now used for 150 lb. working steam pressures at 450 deg. F., or 300 lb. non-shock pressures at temperatures of 450 deg. F., as for oil, water or gas lines.

No mention is made of joining gal-

vanized pipe. It is believed that development work is in progress on galvanized pipe.

Color Dynamics or Color Harmony.—Experience of roads which have employed these color treatments in shop buildings report a decided reduction in fatigue and a definite trend in the reduction of personal injuries. We feel that this is a subject that should be continued and given further study for factual evidence of accomplishment.

Recent developments indicate much progress in the method of making internal inspection of heavy materials, such as driving axles, crank pins, etc.,

having a smooth surface without having to remove them from the locomotive. Some of this special equipment is now on a rental or purchase basis and is being used with satisfactory results by some of the member roads.

Following are members of the committee: N. B. Coggins (chairman), genl. stkpr., Sou.; C. S. Douglas (vice-chairman), asst. p.a., N.&W.; G. E. Hinton, inspr. stores, S.P.; W. C. Hunt, genl. traveling stkpr., A.T.&S.F.; H. C. Miller, sec. to dir. p.&s., I. C.; J. F. Reynolds, class. inspr., Erie; J. P. Sherron, asst. p.a., P.R.R.; R. F. Welch, asst. genl. stkpr., T.&P.; M. E. Towner (chairman-ex-officio), W.M.

roads are not utilizing the original shipping container in the return of old parts for repairs. The various builders are spending a lot of money building heavy, serviceable containers that will protect the various units from damage in transit. If the railroads do not utilize these packing containers to return the old units, they are not only subject to damage in transit, increasing, therefore, the cost of repairs, but they are forcing the builders to continue to manufacture more and more shipping containers at a greatly increased cost to them. This can only reflect in increased cost to the various railroads and if the railroads will exercise care in holding these containers and keeping them in good condition it will help to eliminate the possibility of increased cost on unit exchange and repair and return items.

As a result of our meeting with the builders' representatives, they have indicated that they are in process of substantially increasing the items of material and quantities of these items at their various warehouses throughout the country and expect to be in a considerably better position by the end of this current year.

Interchangeability of Standard Items.—For some time it has been quite evident that the various Diesel builders and also the manufacturers of other power equipment in use by other departments on the various railroads are using a considerable number of parts which come under the heading of standard hardware and trade accessory items. The committee has found that a great many such items, as bolts, nuts, washers, V-belts, roller bearings and a number of other items of material, have been duplicated in the stocks carried by the various railroads. This has come about because each individual builder listed that item by its part number and the railroads did not have identification of this part number with a standard trade description.

After our discussions with the builders' representatives, several builders have agreed to furnish a bulletin or other publication which will describe their part numbers as to interchangeability with all of their own models of equipment and will also give the standard trade designation for the article. One builder has already started such a bulletin and others are in the process of starting. One builder already has a good deal of this information in its present parts book. It will be necessary for subsequent committees to continue along this line until all of these various bulletins are published and distributed to the railroads.

Repairing Diesel Parts.—Since last year's reports there has been a noticeable increase in the number of railroads effecting repairs to component parts in their own shops. Also a large increase in the number of different parts which are being repaired in company shops. Our investigation clearly indicates that it is to a railroad's advantage to consider

DIESEL LOCOMOTIVE PARTS— PURCHASING AND STOREKEEPING

Paper work reduced in exchange and repair of units; two-part tag adopted

A conference with parts representatives of the various Diesel locomotive builders was held in Chicago on March 25, 1948, to discuss various subjects of mutual interest and concern.

The 1947 committee worked out a single two-piece tag which we recommended for universal use. This year the tag was revised in light of more experience and at the meeting with the Diesel builders' representatives it was discussed with them. The builders have agreed to go along with us and will adopt this standard two-piece tag, reserving, however, the right to use colored stripes at the end of the tag, or a completely colored tag of a color of their own choice, as a method of identification for them. Sample tags have been furnished to the builders as a means of setting up their supply and putting them into use with the railroads.

Unit Exchange, Repair and Return.—Considerable progress has been made in the last year in eliminating unnecessary paper work in regard to unit exchange and repair and return transactions. Some builders have revised, and others are in the process of revising, their instructions and simplifying their methods of procedure. In the meeting with the builders' representatives, progress was made in more prompt invoicing of unit exchange items. Some builders are in the process of working up standardized prices for these items and are cutting the time lag between shipment and invoicing of repair costs.

Some progress also has been made with the builders in more prompt handling of repair and return items, not alone in getting the items repaired and returned to the railroads faster than in the past, but also in invoicing



C. R. Clements,
Chairman

the repair costs. This phase, however, will have to be continued and followed by subsequent committees to a final conclusion.

At the meeting with the builders' representatives, it was brought out that there is a considerable amount of money invested in unit exchange items and of necessity the builders have to amortize this investment over its use on the various railroads. It is to the railroads' advantage that when requesting unit exchange items, the old item to be repaired be available and be returned to the builders promptly. The committee believes that 30 days from the builder's shipment of the replacement part should be sufficient time to get the old part off the railroad property. The builders' representatives emphasized that if this could not be lived up to by the various railroads they might have to take recourse to a *bona fide* billing to the railroads and not accept return of the old parts.

Discussion developed that some rail-

the repairs of component parts on its own property. All studies that we have made indicate that there are worthwhile savings to be made in company repairs versus repairs outside of company shops.

One railroad is presently micro-grinding cylinder liner bores instead of boring the cylinder liner or sending the liner outside to be bored. Another railroad has worked up the detail and is ready to start operation on making its own coils for steam boilers. Still another railroad, with foundry facilities, is casting and finishing its own traction motor suspension bearings at a considerable saving over purchase. Two railroads are completely set up to effect all injector repairs and report that this work is being done by them cheaper than they were able to obtain the same work from outside sources.

There are many more examples of all types of component parts that are being tested and worked out for company savings, and future committees should continue to work on this until it has been more completely canvassed and organized.

Porous Chroming Cylinder Liners.—During the past year tests have been expanded on the use of porous chrome-plated cylinder liners. One railroad reports two 16-cylinder sets of these liners in service, one set having reached 300,000 miles and the second set 250,000 miles. Recent examination of these liners showed wear not to exceed .00035 in. Various other railroads have this type of liner under test, although in no case has sufficient mileage been run to give conclusive history on what can be generally expected for service and ultimate cost on this type of cylinder liner.

It is a mechanical department prerogative to indicate whether to adopt this type of cylinder liner, if the tests are completed satisfactorily. However, it will be of considerable value to the stores department if these liners do work out because it will reduce greatly or eliminate completely the quantity of oversize liners, pistons and rings carried in stock, as well as the material value. It will also release, for other uses, the space now taken up by the oversize parts.

In the past, crankshafts have been reclaimed by grinding the main and/or connecting rod journals to various undersizes. This has necessitated the stores department maintaining complete sets of main and connecting rod bearings for the various steps of undersize to which the crankshafts have been ground. It has caused an increase in stores investment due to the number of undersize steps and the numbers of various shop and maintenance points at which it is necessary to carry the various standard and undersize main bearings. In the past few years, however, there have been some tests made of chrome plating crankshafts back to standard journal tolerance or by sleeving crankshaft journals back to standard

tolerances. While it is a mechanical department prerogative to indicate its desires in regard to this type of repair work, any completely satisfactory repair job that can return a crankshaft to its normal standard tolerances will relieve the stores department and the railroad of the necessity for increased inventory in the stocking of both standard and undersize main bearing shells.

Lubricating Oil.—The General Committee referred to Subject Committee 42 the question of standard specifications for Diesel lubricating oil. A subcommittee of Subject Committee 42 was appointed and has studied this question and reports as follows:

Earlier model Diesel engines were generally lubricated with a straight mineral oil. Later additive oils began to make appearance in railroad Diesel locomotives. Within the last year, new models brought out by various locomotive builders have required the use of detergent-type lubricating oils.

The committee has not been able to determine that any railroad has successfully mixed two types of detergent oil in the same Diesel crankcase. There would be considerable saving to the stores department if it were possible to mix crankcase lubricating oil in Diesel engines and would eliminate the necessity for maintaining two or more different kinds of oil at the various maintenance points and it would also simplify the work of oil reclamation.

It is suggested to the General Committee that it request a joint committee with the Mechanical Division to study this subject with the view of the pos-

sibility of procuring compatible oils that can be mixed to the mutual economical operation of both departments.

Following are members of this committee: C. R. Clements (chairman), Diesel traveling stkpr., B.&M.; A. G. Bohorfoush (vice-chairman), asst. g.p.a., Sou.; W. P. Brown, divn. stkpr., C.R.I.&P.; C. E. Bulkley, genl. stkpr., M.-K.-T.; E. A. Carlson, genl. stkpr., C.&O.; H. R. Carroll, traveling stkpr., C.&N.W.; E. F. Delisle, genl. stkpr., B.&A.; G. E. Hargreaves, agt. pur dept., P.R.R.; J. R. Hellums, stores inspr., I.C.; E. M. Hickox, ch. clk to genl. stkpr., U.P.; L. G. Kohler, divn. stkpr., B.&O.; C. J. Kubler, genl. stkpr., K.C.S.; E. Larson, divn. stkpr., D.&R. G.W.; J. Lembach, p.a., F.E.C.; L. G. Marlin, dist. stkpr., G.M.&O.; H. B. Nordstrom, asst. p.a., G.N.; R. H. Pauling, div. stkpr., Erie; I. G. Shapiro, traveling stkpr., N.Y.N.H.&H.; F. J. Steinberger, asst. genl. p.a., A.T.&S.F.; A. A. Taylor, asst. genl. p.a., M.P.; R. R. Kane, asst. genl. stkpr., L.&N.; R. E. Kelly, dist. stkpr., C.B.&Q.; C. H. Thompson, asst. genl. stkpr., S.P.; W. W. Kelly (chairman ex-officio), genl. p.a., A.T.&S.F.

Discussion: In answer to a question Mr. Clements stated that marking mileage on tags attached to parts returned during the time of the warranty was no longer necessary with some builders. Field inspection report now will take care of it.

J. C. Kirk, C.R.I. & P., told the members that his road had been able to mix, successfully, two lubricating oils in the same crank case.

STANDARD MATERIAL CLASSIFICATION

Available data indicates this classification is being used on approximately 87 per cent of the total mileage of Class I roads

The committee recommends that those roads not using the Standard Material Classification give serious consideration to its adoption.

The 1947 committee recommended eliminating the "Description" and "Unit" columns shown on pages 5 to 72, inclusive, in the Standard Material Classification. We recommend that pages 5 to 72, inclusive, of the Standard Material Classification be eliminated in their entirety. The list of material items on these pages is a duplication of information shown in the index.

Considerable study has been given to the advisability of having a catalog compiled by this division [as recommended by Committees 37 and 12 last year] containing standard descriptions and code numbers for all items of railroad material.

The subcommittee that was assigned

to this subject reports:

"Each railroad has its own stock book which, to all intents and purposes, is a catalog and serves the railroads as a catalog. To consolidate it with all the other railroads would mean an almost endless job of changing the standards which have been found satisfactory on that particular railroad in its territory.

"While the standardization of many items used on the railroads is desirable, one catalog for all railroads for all material would have a tendency to set those standards too rigidly so that improvements would not be accepted easily, or if they were accepted on some railroads and not on others, would defeat the purpose of the catalog.

"The committee feels that the cost of such an undertaking would far exceed the advantages claimed for it, and does not recommend it."

Additions to Classifications

Batteries, lantern	25-E
Bags, mail or pouches	36-A
Boxes, skid for lift trucks	36-A
Cases, steel letter, for mail cars ..	24
Heaters, unit, all kinds	36-A
Lamps, fluorescent	25-E
Pads, fabreeka	46
Plows, disk	9
Plugs, dust guard (wooden)	36-A
Plywood	30
Screws, sheet metal	45-A
Shavings	38
Stabilizers, pass. car truck & parts ..	20
Stands, smoking, and parts	24
Supports, brake beam	20
Tanks, overhead water for cars	24..
Torches, alcohol	45-B
Twine, upholstery	24

The members of the committee are as follows: H. Gibson (chairman), asst. gen. stkpr., St. L.—S.F.; F. J. McNulty (vice-chairman), asst. to gen. stkpr.,

B. & M.; J. W. Cockrill, dist. stkpr., I.C.; P. W. Grayson, gen. stkpr., T. & P.; J. C. Hart, insp. stores, C.M.St. P. & P.; F. E. Hartzler, div. stkpr., C. R. I. & P.; W. R. Knauer, head clerk, serv. bur., P.R.R.; D. T. Matthews, dist stkpr., N.Y.C.; A. B. Sears, asst. gen. stkpr., A.T. & S.F.; E. J. Leonard, gen. stkpr., C. & N.W.

Discussion: Discussion centered on committee's recommendation of deletion of pages 5 to 72 of the Standard Material Classification. Paragraph was deleted when it was brought out that this section, containing description and unit, was helpful both to the accounting department and to new men in the purchases and stores department.

PURCHASING DEPARTMENT— ORGANIZATION AND PROCEDURE

The subject of a Standard A.A.R. Material Catalog has been studied by a number of former committees on Subject 12, and its value to the purchasing department in cataloging and numbering standard materials has been recognized. This committee also feels that economies are possible through the cataloging and numbering of materials in constant use by the railroads. Because of its importance to both the stores department and the purchasing department, the committee feels that the projected system appears to possess sufficient advantages to justify a complete study by a special subject committee for that sole purpose.

Escalator clauses in purchase orders and contracts are of grave concern to all purchasing officers. During the past year, some suppliers reverted to the practice of quoting firm prices, while others formerly quoting firm prices are again quoting based on the price in effect at time of shipment.

It is the recommendation of this committee that we continue to vigorously combat the inclusion of escalator clauses in our purchase arrangements, but that when escalation is forced, if possible, we reserve the right of cancellation if an increased price at time of shipment seems unjustified. Further, in the event of a decline in market prices between date of order and date of shipment, that the purchaser will receive the benefit of the decrease. Because of the spiral of soaring prices it was felt that the importance of watching and taking advantage, whenever economically possible, of quantity price differentials should again be pointed out.

In the search for improved methods of handling purchasing department work considerable time was devoted to the study of the spirit duplicator process employed by a number of roads in



Samuel A. Hayden,
Chairman

handling requisitions, bids and orders. Favorably impressed with the efficacy of this method, which appears equally applicable to both large and small railroads, we are including a description of the system which has been employed by one of our large railroads for several years with great success and marked saving in time and labor. It is worthy of serious consideration by any road seeking means of improving this phase of purchasing and stores department operations. [A description of this sys-

tem was attached to the report of the committee.]

Section 10—Clayton Anti-Trust Act—was discussed and measures to insure proper and complete preparation of papers in transactions under its provisions were considered. As a safeguard in the following of prescribed regulations for Clayton Act transactions, one major railroad purchasing department utilizes a set of check sheets which are checked and signed by each person involved in handling such cases. Upon final execution of all pages, these check sheets are filed, with any other work papers on the contract involved, in the purchasing agent's file.

Use of Form Letters.—Attempting to find means of simplifying and reducing the cost of routine work, the committee devoted some time to a study of the form letters used by a number of roads. While the efficacy of form letters when extensively used is questionable, a number of the form letters studied do have substantial merit from the angle of reducing clerical hours and facilitating the handling of correspondence.

It is the opinion of the committee that correspondence in connection with the following subjects can be efficiently handled by the use of form letters: (1.) report of over, short, rejected, or damaged material; (2.) notice of change of order (description, quantity, consignee, etc.); (3.) returning improperly prepared invoices; (4.) cancellation of orders; (5.) furnishing routing instructions; (6.) tracer for invoice for material received; and (7.) Scrap awards.

The members of the committee are as follows: S. A. Hayden (chairman), p.a., M.-K.-T.; S. R. Secor (vice-chairman), asst. to gen. p.a., C. & O.; R. Bostwick, p.a. and gen. stkpr., C. I. & L.; W. A. Clem, p.a., Rdg.; H. M. Dewart, p.a., G.T.W.; C. A. Engelbrecht, ch. clk. pur. dept., P.R.R.; H. V. Gamper, asst. gen. p.a., I.C.; J. U. King, asst. p.a., A.C.L.; E. H. Otto, ch. clk., pur. dept., B. & O.; C. R. Painter, g.p.a., N.Y. N.H. & H.; F. W. Pettit, asst. to g.p.a., W.M.; E. V. Purdy, p.a., T. & N.O.; R. I. Renfrew, asst. g.p.a., N.Y.C.; O. T. Rhode, ch. clk. to g.p.a., U.P.; W. S. Riach, asst. g.p.a., A.T. & S.F.; J. S. Fair, Jr. (chairman ex-officio), p.a., P.R.R.

MAINTENANCE-OF-WAY AND CONSTRUCTION MATERIALS

Electronic communication apparatus an added responsibility of many stores departments

The installation of electronic communication devices being a relatively recent development, there is considerable variance in the handling and distribution of such equipment and repair parts.

Predominantly, however, the stores department is assuming responsibility for such material the same as for other unapplied material and this is the reasonable and proper procedure.

Competitive buying of electronic equipment, except as complete units are concerned, is somewhat circumscribed. This is due to its technical character and insistence by manufacturers that their own parts be used if the device is guaranteed. Certain parts, such as vacuum tubes, are nevertheless becoming standardized. Competitive buying as far as practicable should be encouraged.

It is recommended that: (1) the handling of unapplied electronic equipment and parts be included among the functions of the stores department; (2) that the stores department cooperate closely with the using departments and



W. R. H. Mau,
Chairman

maintain adequate records to effectively hold the stock of such material as low as possible to avoid obsolescence; (3) that stocks be concentrated as much as possible; (4) that repairs to electronic material be centralized and under jurisdiction of the stores department; and (5) that railroads obtain firsthand information, primarily through inspection, of the experiences and accomplishments of other railroads more widely engaged in the use of this equipment.

Discontinuance of Western Union Contracts.—The termination of contracts with Western Union Telegraph Company has already become a reality for some carriers. It is apparent that aside from those railroads which have always maintained their own pole lines and equipment, a number of other railroads already have found or will find it necessary to take over from Western Union the responsibility to provide the material needed to maintain the pole lines and equipment on the right-of-way.

The purchases and distribution of material needed for this purpose are purely purchasing and store department functions. To the extent that it is a new class of material to them, they should work closely with the telegraph department to determine what items should be stocked and to see that adequate but not excessive stocks are available, keeping the customary consumption and inventory records to permit

this. The stocks that the Western Union has on hand at the time jurisdiction is relinquished can become the nucleus for such a stock.

It is recommended that: (1) the jurisdiction of the purchase and stores department be extended to cover all material needed for construction or maintenance of telegraph lines as the carrier assumes responsibility over such stock; (2) that stocks of material, such as poles, wire, hardware and equipment be concentrated at the general or a designated store, except emergency stocks, as agreed upon with telegraph department, which must be located at strategic points on line; and (3) that repairs to equipment be concentrated at a centralized properly equipped shop and under jurisdiction of the stores department, repairs to be made by competent, trained employees.

Signal, Telegraph and Telephone Materials. — In so far as any extensive programmed T. & S. project is concerned that is the option as to whether the necessary materials shall be accumulated at a storehouse and shipped to the job as the work progresses, or whether it shall be shipped direct to the site of the work or the territory where it is to be used, where it would be subject to deterioration, rehandling and misuse. Except in the case of heavy, cumbersome items which present storage and costly rehandling problems, there seems little question that the former method is the one that is to be recommended. The former method lends itself most readily to store control of the material from its purchase to its use.

It is recommended that: (1) requisitions for signal, telegraph and telephone program work be checked against available stock; (2) that heavy material be shipped direct to the job; (3) that all other material be accumulated at a con-

venient store, (4) that the material be shipped to the job, as scheduled, to conform to the work's progress; (5) that material on the job be placed in charge of a stores representative if size of the job so warrants; and (6) that surplus material from any project should be promptly returned to the store department.

Economy in Handling Repairs.—There is no hesitation in making the broad statement that the most economical way to make repairs is to concentrate them at a centralized shop and that such repair work should be under control of the stores department. Without question, the extent to which repairs should be made, that is, speaking of volume, should be dictated by the stores records of material on hand and consumption and should be governed by stores orders on the shop doing the work.

Perhaps the most impressive arguments in favor of stores control of repairs to material are its ability to control how much material shall be repaired and when, to avoid spending money in advance of the need; to police when material shall be repaired, based on its knowledge as to whether the material is standard and the relationship of cost to repair material, versus its cost new; its ability to realize maximum utilization of secondhand and scrap materials; and the important fact that by concentration costs can be reduced and controlled.

It is therefore recommended that repairs to maintenance of way material and equipment should be concentrated at a centralized point under supervision of the stores department and if such supervision of work is delegated to another department, the stores department should exercise control of the output of the shop where the work is done.

At the present time, when the cost of materials has rocketed so high and



Storage of maintenance-of-way material under cover

shortage of various items is still a problem, there is more reason than ever before to emphasize the importance of proper care of unapplied material, whether it is concentrated at a storehouse or distributed along the right of way. Material at the storehouse can, of course, be cared for far better and more economically than after it is shipped out on the line, although it is the responsibility of the stores department, regardless of its location, until it is actually used. The degree to which this care can be exercised after the material has been distributed may be somewhat dependent on the extent of the stores organization, but need not necessarily be limited thereby if an impressive educational campaign is conducted to convey to the using department the value of the material involved and the importance of its proper care and protection; also the error of holding material in excess of reasonable need at the probable expense of a shortage elsewhere.

There is another important reason for the care of material that is away from the supervision it gets at the storehouse and that is its availability for misuse, malicious or otherwise, which may—and has in the past—created unnecessary hazards.

It is for these reasons that we have

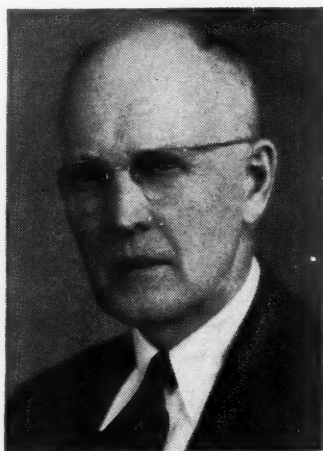
stressed in this report that materials for programmed work should be accumulated at a storehouse and shipped to the job as the work progresses, reducing the time it is on the line—with relatively less protection—to the minimum possible.

The recommendations made in this report, while dealing with classes of material not previously discussed by this committee in detail, do not propose treatment of the material that conflicts with our Manual; in fact, the application of the well established rules of our Manual was in the background of the committee's consideration.

Following are members of the committee: W. R. H. Mau (chairman), p.a., I.-G.N.; E. Bartos (vice-chairman), traveling stkpr., A.T.&S.F.; R. R. Anderson, asst. genl. stkpr., G.N.; J. C. Blackwell, dist. stkpr., I.C.; B. A. Cumbea, dist. stkpr. C.&O.; J. M. Day, asst. to genl. stkpr., S.P.; A. C. Harris, m. of w. stkpr., C.M. St. P.&P.; J. H. Howland, traveling stkpr., C.&N.W.; F. A. Jarres, divn. stkpr., B.&O.; R. H. Johnson, dist. stkpr.; C.B.&Q.; M. G. Jones, asst. to genl. stkpr., P.R.R.; A. P. Pollard, traveling stkpr., B.&M.; R. W. Tomlinson, asst. p.a., Rdg.; F. C. Warren, genl. stkpr., S.L.-S.W.; N. V. Oldenbittel (chairman ex-officio), genl. stkpr. A.C.L.

STORAGE AND MATERIAL HANDLING

Savings can be realized at many locations by the use of pallets and mechanical equipment



J. E. Thruff,
Chairman

There are various methods of making deliveries to shops, repair tracks and roundhouses, and while this committee recommends that these deliveries should be made by the stores department, it is realized that on some railroads this cannot be done due to existing labor

contracts. Our investigation indicates that because of varying conditions, any attempt at recommending a fixed or standard method of handling is made impracticable. The committee does recommend a continual search for and development of methods that will produce the most economical results.

A few examples, taken at random, showing typical savings made possible by the adoption of changed methods, follow:

Road A

A saving of 32/3 hours, or \$3.73, in the cost of making a complete delivery of boiler tubes to the point of use via straddle truck, as compared with the tractor and trailer method. The operation involves movement of 8,000 lb. lots over a distance of approximately 2,500 ft.

Delivery of switch material (2 frogs, weight 6,000 lb.) from stock pile to freight station, a distance of 3,500 ft. via straddle truck at a cost of \$.2933 per ton, or a net saving of \$3.06, as compared with the former method of doing the job with tractor and trailer.

In the movement of paints and oils (12 drum lots) from storage to point of use, straddle truck versus tractor

and trailer showed a saving of 21/6 man-hours or \$2.19 in cost in favor of the straddle truck.

Straddle truck handling versus fork truck produced the following:

Angle bars in 6-ton lots, a distance of 1,500 ft.—

by fork truck 1 1/3 man-hour

by straddle truck ... 1/12 man-hour

Track bolts and spikes in 9,000 lb. lots, a distance of 1,500 ft.—

by fork truck 1 man-hour

by straddle truck ... 1/12 man-hour

Paints and oils in 12 drum lots, a distance of 2,000 ft.—

by fork truck 1 1/12 man-hour

by straddle truck ... 1/6 man-hour

Loose cast wheels (12) a distance of 1,000 ft.—

by fork truck 1 1/2 man-hour

by straddle truck ... 1/12 man-hour

Mounted wheels and axles (3 pairs) a distance of 2,500 ft.—

by for truck 1 1/2 man-hour

by straddle truck ... 1/6 man-hour

Substitution of pallets and fork truck for hand trucks in the handling of one carload (15,000) locomotive fire brick from car to storage produced a saving of \$6.184 per M, or 90 man-hours.

A carload of miscellaneous materials, such as oils, paints, nails, couplers, car castings, forgings, etc., placed on floor of the car loose and in cans, drums and boxes, required 80 man-hours plus supervision to unload via the hand truck method, while an identical quantity of like items loaded in trays and on pallets and unloaded via fork truck required but 6 hours, plus supervision.

Road B

Examples of savings effected in the unloading and piling of materials on pallets as arranged for fork truck handling:

1 Carload draft gears—

Palletized 1/2 man-hour

Not palletized 8 1/2 man-hour

Saving 8 man-hours

1 Carload welding rods—

Palletized 1/2 man-hour

Not palletized 30 man-hour

Saving 29 1/2 man-hour

1 Carload steel fence posts—

Packaged (250 to

bundle) in open top

car 2 1/2 man-hour

Not packaged and in

closed car 24 man-hours

Saving 21 1/2 man-hours

Road C

By changing from rolling and hand truck use to fork truck handling of loose cast wheels, Road C was able to show a saving of from \$1.76 to \$2.72 per 100 wheels in the cost of unloading from box cars to storage racks. Comparable savings were also shown in the loading of scrap wheels for return to the foundry, in which other methods formerly were used.

Packaging Reduces Manual Labor.—It is an accepted fact by this committee and Purchases and Stores Division members that correct packaging of materials not only preserves the item in safety, but

considerably reduces the handling expense.

Stores department organizations are familiar with packaging requirements and should revive the campaign for packaging through their purchasing departments. Requests on suppliers by purchasing agents to package certain items on specific orders produce better results than widespread general requests by this or other committees of Purchases and Store Division.

Standard Pallets and Lift Trucks?—The committee recognizes the fact that conditions vary on the majority of our railroads—conditions even vary on different divisions or districts of large railroad systems to the extent that equipment or standards on one division or district are undesirable on another. It is for this reason that we do not recommend in this report a certain capacity or style of fork truck, or specific style pallet.

The practicability and economy of fork type trucks with use of pallets is generally accepted by railroads, manufacturers and large handlers of material. Railroads, in working out their own palletizing problems, have an advantage in soliciting suppliers to adopt practices that reduce railroads' and shippers' handling costs.

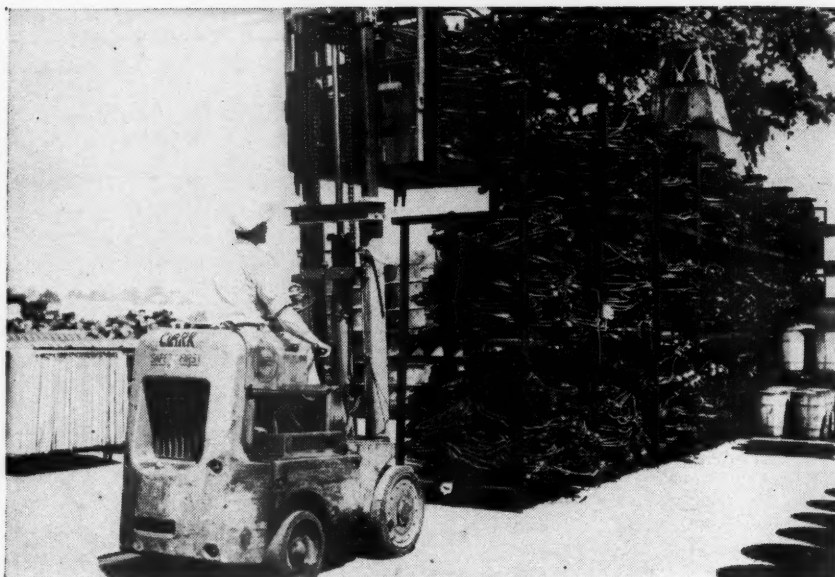
Four-way pallets manufactured of corrugated paper in standard sizes are available at a cost of about sixty cents each. Shippers should be encouraged to use these pallets, especially on off-line purchases, where the location of shippers and transportation costs make returning pallets to shippers impractical.

Numerous items lend themselves to fork truck handling without the use of pallets. Tests should be made with the view of suggesting to shippers how certain items may be arranged economically for fork truck handling without use of pallets.

Floating Load Used.—Material placed on flat top pallets for shipment should be carefully banded and/or bulkheaded, so as to withstand vibration or a reasonable shock from train movements. Uniformly loaded pallets in cars should be tightly banded into floating loads in order to hold the load intact on pallets under normal train shock. This procedure permits the pallets and contents to shift as one unit with minimum displacement.

The committee recommends that individual railroads request manufacturers and suppliers to package, also prepare for fork truck handling, certain items on specific requisitions, prior to placing orders. This practice influences better results.

It is our recommendation that purchases and stores officers volunteer their assistance to manufacturers and suppliers in working out palletizing problems. We propose that railroads lend their efforts to influence "palletizing at point of origin as being shippers expense and responsibility"; however, we



Special racks containing brake beam supports being stacked

should encourage and assist shippers in every way possible in this respect.

We also ask officers of member railroads who are not employing pallets and fork trucks to visit railroads that are, for proof of utility and economy in the operation of this equipment.

Among the items that lend themselves to banding in bundles or strapping on pallets for shipment and storage which have not heretofore been mentioned are acetylene, brake beams, fire and arch bricks, cleaning compounds, welding rods, barbed wire, etc.

Fixed Facilities.—Like other buildings in use on railroads, most of our present storehouses were designed and built before material handling became me-

chanized, and sizes, locations as well as track layouts cannot in most cases be altered. Where alterations and additions are made, consideration should be given to making such changes as will better fit into the scheme of things brought about by the use of mechanized equipment. To this end, an effort should be made to provide ample space for storage in bulk on pallets or skids without breaking packages, except for working stock.

Hard surfaced roadways are necessary to connect all buildings and locations where materials are stored or delivered. They must be of sufficient width to accommodate motorized equipment. Unloading platforms wide enough to permit safe use of power-operated trucks,



Straddle truck transporting loose wheels

and aisles within buildings wide enough for free and easy use of trucks in the complete handling in and out of storage on skids or pallets, are among the more important features to be incorporated in the plans for new construction.

(Recommended rule changes were appended.)

The members of the committee are as follows: J. E. Thraff (chairman), asst. gen. strkpr., G. N.; E. G. Roberts, (vice-chairman) gen. strkpr., C. R. I. & P.; J. V. Anderson, asst. gen. strkpr., C. M. St. P. & P.; A. J. Baker, div. strkpr., A. T. & S. F.; G. H. Bolton, tie and timber agt, B. & M.; S. L. Bouque, asst. gen. strkpr., S. P.; E. J. Fowler, trav. strkpr., Sou., W. E. Fox, gen. foreman stores, C. & O.; D. E. Frank, wks. strkpr., P. R. R.; G. R. Merryman, gen. strkpr., C. of N. J.; B. H. O'Meara, trav.

strkpr., M. P.; H. A. Parr, asst. gen. strkpr., N.Y.C.; W. M. Robertson, gen. strkpr., C. & E. I.; M. F. Stewart, strkpr., N. & W.; K. C. Thompson, dist. strkpr., N. P.; G. D. Tombs, asst. mgr. stores, I. C.; C. J. Vanderbosch, asst. gen. strkpr., B. & O.; W. H. Young, gen. strkpr., S. A. L.; C. L. Wakeman (chairman ex-officio), gen. strkpr., Wabash.

Discussion: C. E. Swanson, C.B.&Q., L. J. Ahlering, C. & E.I., and J. S. Fair, P.R.R., led a discussion in which the main point was to determine how best to get suppliers to ship in unit loads. These men insisted that concerted action was necessary in order to get this done. It was decided that all roads would let Mr. Farrell know which items from the list above they were going to work on. Purchasing agents were urged to request unit load shipments.

FIRE PREVENTION — SAFETY PRACTICES

With new materials and equipment entering the picture from day to day, we must be prepared to meet the new hazards and exert our best efforts in the prevention of accidents



W. T. McCauliff,
Chairman

In the general interest of accident prevention, we suggest:

1. Safety is everybody's business. One unsafe employee can be a menace or a hazard to every one of his fellow employees with whom he must work.
2. Accidents are not just fate. There is a definite reason for every accident or injury.
3. Safety is not just a question of rules and their observance. It involves the cultivation of safety habits, self-restraint and control.
4. Working safely is something which must begin with the individual worker. It is an acquired habit and in no way

different than other habits in our ordinary mode of living. It is not much more difficult to acquire a good habit than a bad one.

5. Good housekeeping and safety usually go together and with them efficiency in both production and quality.

Fire Prevention.—Constant inspections g.p.a., M.P.

should be made to eliminate potential fire hazards. With particular attention being given to fire hazards commonly associated with careless smoking, poor housekeeping, improperly maintained equipment and fire fighting appliances, a desirable reduction of hazards should be obtained.

Scheduled meetings should be held with employees to instruct and to receive suggestions, with previous fires reviewed and discussed to determine cause and remedy.

It is recommended that the following suggestions be observed:

1. Make sure fire fighting equipment is in working order.
2. Smoking should never be permitted in and around buildings.
3. Metal containers be used to store all packing material, rubbish and sweepings.
4. Careful and cleanly maintenance of storehouses and proper methods used in storing and handling of materials will be the safeguard against fire.
5. Competent employees should police storehouse daily prior to closing time to see that premises are free from any factor that might cause fire.
6. Signs be placed on storage buildings where combustible materials are stored reading: "Keep Lights and Fires Away." Open flame lights, fires or smoking must never be allowed in or around buildings or locations.

The members of the committee follow: W. T. McCauliff (chairman), asst. gen. strkpr., N.Y.C.; G. Wonnell (vice-chairman), strkpr., P.R.R.; L. V. Foley, asst. gen. strkpr., G.M. & O.; C. S. Jones, asst. gen. strkpr., S.P.; W. M. Stratton, dist. strkpr., C.N.R.; E. J. Urtel, div. strkpr., B. & O.; J. H. Lauderdale (chairman ex-officio)

STATIONERY AND PRINTING

The railroads' stationery and printing bill in 1947 was \$31,662,000

Total operating revenues for Class I roads in the year 1946, based on annual reports, amounted to \$7,627,650,517, compared to stationery and printing expenditures of \$26,706,000. Thus the ratio of stationery and printing expense to railway operating revenues for the year 1946 was 0.35. Total operating revenue for Class I roads for the year 1947, based on monthly reports, was approximately \$8,685,000,000, compared to stationery and printing expenditures of \$31,662,000, a ratio of stationery and printing expense to railway operating revenue for the year 1947 of 0.36.

Everyone is familiar with the term "recurring charges" because they ap-



Vincent Erb,
Chairman

pear every day of our lives. In order to present a better picture, the committee selected six items in common use on all railroads as follows:



While the railroads' stationery and printing bill in any one year represents a sizeable amount of money, such expenses actually amount to less than one-half of one per cent of gross

Tickets and passes.
Printed and planographed tariffs—line & bureau.
New mechanical office equipment (including repairs and upkeep).
Train sheets and train orders.
U. S. postage stamps, post cards and stamped envelopes.
Tabulating cards.
Figures submitted by eleven carriers for the year 1947 show the ratio of these selected items to total stationery and printing expenses on these roads to be 39.46.

Tickets represent revenue, and because of this we know they are accounted for, carefully handled—in fact, under lock and key because someone along the line is responsible at all times—yet every other item of material also represents money; and, at today's increased cost, a discarded train sheet means throwing away 30 or 40 cents. Dropping or misusing a machine may ruin a \$100 or \$1,000 investment, so that the necessity for proper care of all mechanical office equipment, and the careful use of all items of materials and supplies, as if they were our own property, is obligatory—especially when we consider that these few items alone represent 39.46 per cent of the total expense for stationery and printing supplies.

Standardization of Forms.—The committee has studied the possibility of standardizing such forms as time cards, train switch lists, vouchers, conductors' wheel reports, etc., but makes no definite recommendation. It hopes that member roads will give the question thought and submit suggestions to the chairman of Committee Subject 13, which will permit a continuation of the study and perhaps lead to a definite recommendation. The adoption of standard forms offers a saving in the purchase of the form, as well as most efficient operation in their use.

Savings in Printing.—As eastern railroad is featuring time tables with a "new look." Instead of being longer, however, they are shorter and narrower

—in other words, vest-pocket timetables, size 2¾ in. by 4½ in., printed in different colors of ink. They are now available to the traveling public at all points on the system. It is believed the size of the leaflets facilitates the carrying by passengers as they can easily be folded to fit into a man's pocket or card case, or into a women's small pocketbook. In addition, the paper saving is quite substantial, and it is esti-

imated that printing costs were reduced approximately 35 per cent.

The committee is of the opinion that this idea may be worth the consideration of other railroads, since the vest-pocket timetables are not only attractive, but permit a saving of paper stock and a reduction in printing costs.

P. & S. Department Manual.—A complete revision of present Rule 13 in the Purchasing and Stores Department Manual was considered by the committee so that it would include the principal fundamentals relating to stationery and printing. The proposed revision of this rule was appended to the report.

The members of the committee follow: Vincent Erb (chairman) stnr., Reading; G. W. Kendall (vice-chairman), stnry. buyer, A.T. & S.F.; C. C. Anderson, stnr., N.P.; H. Carter, gen. stnry. stkpr., N.Y.C.; P. R. Dawson, stnry. stkpr., B. & O.; O. D. Fisher, stnry. stkpr., P.R.R.; W. W. Griswold, stnr., C.R.I. & P.; C. C. Harvey, stnr., D. & R.G. W.; L. M. Heinrichs, stkpr., S.P. & S.; R. A. Holman, stnry. buyer, C. & N.W.; F. J. Mayer, stnry. buyer, I.C.; R. L. Newcome, stnr., D.L. & W.; H. E. Peckover, stnry. stkpr., C. & O.; K. W. Phillips, buyer, pur. dept., B. & M.; W. A. Tyner, stnry. agt., C.P.; J. T. Van Horn, stnr., M.P.

MATERIAL STOCK REPORT—INVENTORY AND PRICING METHODS AND PRACTICES

As suggested by the 1947 committee, consideration and study was given to reporting Diesel fuel as a separate entry on the material stock report. This committee also recommends that the item covering locomotive fuels be subdivided as follows: coal; diesel fuel oil; heavy fuel oil. A separation of the three types as recommended, will enable managements more accurately to analyze the investment in that class of material.

It is suggested that if the above change is made in the material stock report, consideration should also be given to a similar change in the detail of this class for balance sheet purposes.

The last report indicates the following:

Period	Total Roads Reporting	Total Average Miles Operated	Total Average Monthly Disbursements	Total Value Unapplied Material	Total Average Days Supply
Dec. 31, 1947	107	220,888	\$180,740,664	\$723,529,832	120
June 30, 1947	113	224,782	160,917,686	718,840,623	134
June 30, 1946	114	224,425	145,351,711	603,151,944	125
June 30, 1941	118	230,060	94,159,350	368,664,115	117
June 30, 1940	119	229,223	82,645,129	328,197,328	119

As with respect to other industries, the railroad inventory has increased enormously in recent years. That is to

be expected both because of increase in prices as well as increase in the transportation volume. The June 30, 1947, figures, however, reflect high supply in days, indicating a possible excess in physical volume.

Inventory.—It is recommended that further consideration be given to a combination stock book and inventory form designed to serve both purposes, on which entries may be made for four to six year periods. This type eliminates the necessity of writing or Addressographing inventory sheets each year and is limited only to the extent of the number of years provided for on the form.

We suggest that member roads, not now doing so, consider spreading the annual inventory over a twelve-month



W. K. Smallridge,
Chairman

period in preference to taking all classes on a specified date. This method eliminates the peak load normally placed on stores and accounting departments when the inventory is confined to a relatively short period.

Inventory values are just about at an all-time high. This intensifies the need for adequate and proper facilities, increased attention to protection from damage in storage and distribution, and continuous study of the type of material coming to hand. The change in type of material included in the inventory, particularly as a result of the use of Diesels, literally places stores people in a position where they must begin all over to learn the nature of the particular pieces involved and the part they play, if adequate protection is to be afforded to the inventory investment.

Pricing Methods and Practices.—Conservatism is recommended in establishing prices for secondhand and relay parts and, if possible, use of a fixed top price at which relay track materials are included in the account.

Growing popularity in the use of key-punch machines on a rental basis warrants investigation by member roads interested in this system, and the committee recommends that the use of this type of machine be explored to develop possible adaptation to present accounting methods as practiced on individual roads.

The members of the committee follow: W. K. Smallridge (chairman), asst. gen. stkpr, N.P.; J. S. Baker (vice-chairman), insp. of stores, C.B. & Q.; G. A. Belson, dist. stkpr, C. & N.W.; C. L. Foust, gen. foreman, I.C.; William Gernon, div. stkpr, T. & N.O.; J. P. Hogan, ch. accountant, stores, Erie; W. P. McPhilamy, accountant, N. & W.; F. A. Murphy, dist. stkpr, B. & O.; J. F. Riddle, statistician, stores mgr. off., P.R.R.; J. W. Rodgers, p.a., B. & L.E.; E. J. Rothwell, ch. clk to gen. stkpr, C. & O.; C. Williams, supv. mat stndrds, M.P.; C. B. Neubauer (chairman ex-officio), asst. to v.p. Sou.

FUEL — COAL, FUEL OILS

Consumption of Diesel oil up 152 per cent since 1944, but coal use has declined

Attention is called to the 152 per cent increase in consumption of Diesel fuel oil in 1947 vs. 1944, whereas coal consumption decreased 19 per cent and residual fuel oil decreased 10 per cent. The Bureau of Mines estimates that the increase in demand for all distillates in 1948 will be 16.8 per cent over 1947, but indications are that the railroad requirements for Diesel fuel oil will increase approximately 55 per cent over the 1947 consumption. On the other hand, the Bureau of Mines estimates the increase in demand for all residual fuel oil in 1948 will be about 1 per cent over 1947, while preliminary estimates indicate the railroads' residual requirements will decrease about 6 per cent in 1948 as compared to 1947. This is due to a limited amount of conversion of oil-burning steam locomotives to coal, as well as retirement of oil-burning steam locomotives and replacement with Diesel power. While no figures are available as to estimated railroad coal consumption in 1948, it can safely be said that every indication points to a continuing decline.

Attention is directed to the inadequate supply of virgin gas oil from which the best grade of Diesel fuel oil is manufactured. This has resulted, and will continue to result, in a greater tendency to the use of blends of cracked gas oil and kerosene to produce Diesel fuel oils having lower cetane ratings.

Indications are that the demand for petroleum products in 1948 will greatly exceed that of 1947. This demand has caused crude requirements to reach a new high of approximately 5,500,000 barrels per day, and this in turn has evidently been the cause of a 60 per cent increase in crude oil prices since March 1, 1947. Consideration should be given, in expanding the use of Diesel power, to the rapidly rising cost of Diesel fuel oil, which has been and will continue to be aggravated by the ac-

celerated demand for distillates of all types for heating and burning purposes. If additional gas pipe lines are completed this summer it will insure an ample supply of gas for industry use, which should result in more residual fuel oil being available for railroads in the winter of 1948-1949.

In order to keep the Purchases and Stores Division of the A.A.R. fully informed at all times as to requirements of residual fuel oil and Diesel fuel oil, it is suggested that a quarterly report be rendered by each railroad, covering residual fuel oil and Diesel fuel oil separately.

Bituminous Coal.—The year 1947, like the two preceding years, again presented many problems to the railroad procurement officers charged with the responsibility of securing and maintaining an adequate supply of fuel coal.

On the average, the quality of railroad fuel has not improved during the past year. Due to the heavy industrial demand for coal during the year and the exorbitant prices which prevailed at times for coal for export and for lake transshipment, the railroads were forced to buy some marginal quality coal to protect their requirements.

Most railroads have, during the past several years, stored coal on the ground and carried total stocks in excess of normal requirements. The expense of putting coal on the ground and picking it up again is considerable and materially increases the cost of fuel. However, such storage does release badly needed equipment for reloading at the mines, and in view of the uncertainty of shipments, the many work stoppages in the past few years, and with no prospect in view of a change in these conditions in the immediate future, it would seem that ground storage of coal is not only advisable but almost a necessity if the railroads are to protect their require-

Fuel Consumption: Annual statistics on locomotive fuel consumption for Class I railways are as follows:

	Coal (Net Tons)	Residual (Heavy) Fuel Oil (Gallons)	Diesel Fuel Oil (Gallons)
1947.....	100,412,742	3,770,859,948	733,140,811
1946.....	100,620,710	3,848,134,150	519,810,365
1945.....	115,048,842	3,960,538,725	418,703,820
1944.....	123,636,459	4,192,048,933	290,107,271

Exhibit A—Residual Fuel Oil*

Quarterly Report—As of.....

Storage Capacity Barrels	BARRELS IN STORAGE		Actual Consumption During Quarter By Months	Estimated Consumption Ensuing Six Months By Months
	Start of Quarter	End of Quarter		

*Same form for Diesel Fuel Oil except that the word "Diesel" displaces "Residual" in heading.

ments. It is anticipated that the demand for coal from industry will continue strong for some months to come, almost certainly until the close of lake navigation late in the fall, and export also will continue to move in fairly good volume the balance of the year. Coal purchasing agents still have difficult days ahead of them.

Purchasing and Stores Department Manual.—In reviewing Rule No. 11 of Purchasing and Stores Department Manual, the committee is of the opinion that separate manual pages should be inserted for residual fuel oil and Diesel fuel oil. Section 9 of the present Manual Rule No. 11 should be eliminated if these two recommended pages are adopted.

Following are the members of the committee: W. G. Rathert (chairman), asst. p.a., M.P.; E. S. Bonnet (vice-

chairman), fuel p.a., N.Y.C.; C. F. Bayer, p.a., D.L.&W.; J. J. Bilek, fuel buyer, C. & N.W.; J. R. Clary, g.p.a., N.Y.C. & St.L.; F. L. Dobson, fuel p.a., P.R.R.; M. P. Foley, fuel p.a., C.P.R.; E. H. Hughes, p.a., K.C.S.; E. L. Jensen, div. stkpr., N.P.; A. E. Johnson, asst. to ch. pur. off., C.M.St.P. & P.; H. E. Martin, fuel agt., St.L.-S.F.; J. E. May, fuel agt. B. & O.; J. F. McAlpine, asst. g.p.a., C.B. & Q.; M. H. McGlynn, fuel agt. C.R.I. & P.; H. N. Ricks, fuel supv., T. & P.; E. H. Titgen, fuel agt., M.-K.-T.; L. C. Walsh, asst. p.a., A.C.L.; S. C. Welby, g. fuel agt., C.N.R.; W. H. Weymouth, fuel agt., A.T. & S.F.; W. T. Lambert, asst. g.p.a., S.P.; C. N. Lammers, ch. insp. and chem., C. & E.I.; H. O. Wolfe, p.a., G.M. & O.; W. V. Zimmerer, asst. to p.a.-coal, Erie; G. M. Betterton (chairman ex-officio), g.p.a., S.P.

This year the committee has given careful study to the reclamation of manganese crossings and frogs, and to the flame hardening of frogs. [The recommendations of the committee are included in the report but not in this digest.]

It is also recommended that this manual include recommendations concerning the following items which have been contained in previous reports of this committee:

	See Proceedings
Cans, open top and welded ware	1946
Hangers, brake, freight car....	1940
Hose, metallic steam	1947
Levels, track	1941
Lifts, coupler lock	1941
Lugs, coupler draft	1941
Pistons, triple valve	1941
Plates, striking	1941
Screws, stoker	1940
Rail	1936, 1946
Rods, switch controller	1941
Skids, material	1937
Wedges, journal bearing	1940

Contact with Other Divisions.—This is a joint committee, consisting of Purchases and Stores, Mechanical and Engineering Division members, and the following items have been referred to the Mechanical Division for tolerances in reclamation practice, but no report has been received to date:

Coupler knuckle pins A-M-118-36-1, 2, 3. Method of straightening knuckle pins and recommended heat treatment, if necessary.

Journal box wedges D-24-B-1934. Wearing limit for thickness. (Note: A number of roads are restoring the contour of the wedge by grinding, milling or machining, requesting the limit of thickness on such wedges).

Brake Shoe Wear, Rule 42, Interpretation #2. Make definite rule under 42, Limit of Wear, to cover brake shoe removal.

In compliance with instructions from the General Committee, we have given consideration to changes that would

GENERAL RECLAMATION

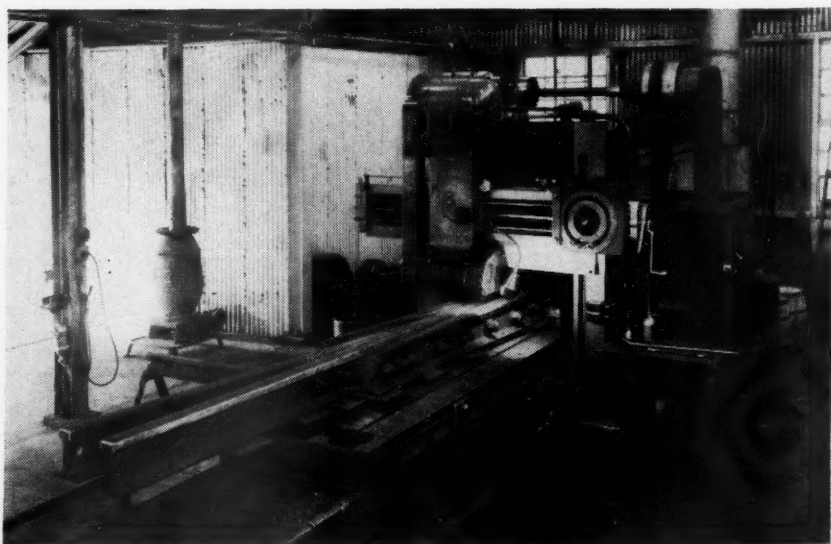
Reclamation on the railroads is of ever-increasing importance due to the increased cost of new materials

The costs of new material have practically doubled since prewar days, so that in an effort to combat rising material costs, which so vitally affect the costs of railroad operation, it is self-evident that reclamation becomes of paramount importance and everyone in our industry should endeavor to repair and reclaim all material possible to make the old parts serviceable again and reduce our material costs; and at the same time reduce our demands for new material which would also be very much to the interest of our national economy, in view of the fact that the mills are not able to produce enough to go around. Let us all adopt the slogan "Material Is Money—Save It."

Reclamation Manual.—The committee last year made a start on the new reclamation manual to be used as a guide in the operation of our reclamation plants, and last year it presented manual recommendations on the reclamation of track bolts and track tools. These two recommendations were approved at the 1947 annual meeting. The work on this manual will be so voluminous that we cannot hope to complete it in any one report, but we will add to it as rapidly as possible in our yearly reports. This manual is offered as a guide for doing the work in each plant, subject to such changes as departments on each railroad may feel necessary to make it suit their own conditions. The committee, however, will welcome suggestions for any changes in the manual.



A. M. McHenry,
Chairman



Grinding wheel in swing frame grinder for making slot between wing and wing rail

be necessary in the Purchasing and Stores Manual. As we find that there is practically nothing shown in our manual on this very important subject, we submit for consideration a new rule to be incorporated in the manual, the location of this rule and the numbering thereof to be left to the discretion of the Manual Committee.

(The committee proposed that the reclamation department shall be supervised by a "supervisor of reclamation," who would report to the chief stores officer. All work should be done to using department specifications. Other details of the rule specified organization, safety practices, etc.)

The members of the committee are as follows: A. M. McHenry (chairman), p.a. and stkpr., G. C. & S. F.; John Voorhies (vice-chairman) supt. scrap

and reclamation, N.Y.C.; E. R. Casey, supt., reclamation plant, U.P.; Paul H. Day, gen. foreman, B.A.R.; L. F. Duval, supv., reclamation, A.C.L.; D. G. Frazer, Sr., asst. supv., scrap and reclamation, I.C.; T. F. Kelly, dist. stkpr., N.Y.N.H. & H.; A. M. Stebbins, dist. stkpr., N.P.; O. L. Temple, supv., reclamation, N.Y.C. & St. L.

Discussion: A member from the West commented that the report did not have enough specific information, especially pertaining to the Brinell obtained when reclaiming manganese frogs and crossings. He suggested that one of the photos in the report showed that there was some roll over of metal. To counteract this, the Santa Fe, he said, was building the weld a little high so that when beaten down by traffic there would not be a low spot at the weld.

MATERIALS IN PROCESS—STORES AND SHOP ORDERS

Materials to be procured was divided into three general groups in a discussion of what should be purchased outside and what should be manufactured in railroad shops. The groups were as follows:

1. Material which, because of the nature of the design, could obviously be purchased cheaper than it could be made in the shops.

2. Material which, because of the design or circumstances of use, will necessarily be made in railroad shops.

3. Material which might be either purchased outside or made in the shop from a standpoint of desirability and economy.

In considering the third general group of material required, as to the desirability and economy of shop production or of purchasing outside, all factors should be carefully evaluated before a decision is made as to the better way to handle.

In particular, the factor of economy should receive careful consideration. On some railroad, store order costs are compiled on the basis of:

(a) The invoice cost of the material, plus a small percentage for stores handling.

(b) The actual labor cost, including vacation and retirement allowances.

(c) A labor overhead which may be arrived at by simply adding a percentage to take care of the other expenses incidental to the operation of that shop during the month in which the work is done.

It is evident that the addition of labor overhead on the basis outlined will not give us the true cost of procurement by shop manufacture, because of many other items of expense, such as should be added to arrive at a price comparable to an outside purchase price. This might include accidents, depreciation, insur-

ance, repairs to track and shop buildings, the investment in shop facilities and tools, the manufacture of selected or special materials which may be used only intermittently and be a source of expense when not in use.

Industry in general also assesses much higher percentages over labor costs than we would arrive at on the basis as outlined. Therefore, we are forced to the conclusion that we must add something to shop order costs to arrive at an equitable comparison with outside purchase prices.

It is not necessary to ask the accounting department to change its practice of distributing the costs of the operation of the railroad, but, rather, that the labor overhead, if arrived at on the basis as outlined, should be increased and, in general, doubled for the purpose of comparing shop costs with outside purchase price. If the railroad discontinues the purchase of, and starts to manufacture material needed for use on the railroad where shop order costs, on the direct basis, just equal the outside purchase price, the ultimate expense to the railroad will be greater because of manufacturing instead of purchasing the material.

Therefore, we recommend proceeding cautiously in the matter of substituting shop manufacture for outside purchase of material. A comparison of costs should be made, but all of the elements of cost in shop manufacture must be included in the shop figure in order to arrive at the proper decision. As to some items whose procurement still is a problem, necessity rather than cost is the governing factor and the decision to buy or manufacture will be dependent on the relative availability at the time of fabricated or of unfabricated material,

rather than on which method would work out cheaper on a dollar and cents price comparison.

Last year's report also recommended the organization of a permanent Shop Manufacturing Committee, consisting of representatives of the purchases and stores, accounting, mechanical and test departments. We again recommend serious consideration of this by the member roads.

The previous report also recommended the establishment of separate manufacturing shops, where the volume of work would justify it, rather than the manufacture of material in the regular maintenance shops. We again recommend consideration of this method of handling because, in the separate manufacturing shop the procurement of material for the storekeeper is of primary rather than of secondary importance.

Manufacture and Repair of Diesel Material.—With the large number of Diesel locomotives now in service it is important that a thorough study be made of costs for repairing certain Diesel locomotive parts in railroad shops. Some of the important items are as follows:

- Engines
- Traction motors
- Generators
- Truck assemblies
- Injectors
- Governors
- Lubricating oil pumps
- Water pumps
- Diesel engine blowers
- Pilot valves
- Fuel pump motors
- Fuel pumps
- Grid blower motors
- Radiator fan motors
- Speed increaser gear box
- Speed increaser clutches
- Traction motor blowers
- Traction motor blower motors
- Auxiliary generators

When repairs can be accomplished in the railroad shops to component parts of Diesel locomotives, such as those listed, it will result in considerable time saving, better stock control and less investment than if material had to be returned to manufacturer for repairs.

It is the recommendation of this committee that individual roads make thorough studies of the possibilities of manufacturing certain Diesel locomotive parts now being purchased.

Owing to the close tolerances and exacting conditions which must be met in the manufacture of Diesel maintenance items, the Shop Manufacturing Committee, in conjunction with the mechanical engineering department, should check carefully all conditions before attempting to set up for manufacture in railroad shops. Because the number of units in service is increasing, it will be worth while to make this extra effort, and, if the technical side of the production problem is successfully cleared up, cost comparison should be made similar to that which would obtain on other materials.

This is a comparatively new field from a shop manufacturing standpoint and it is recommended that future committees give this first attention to bring-

ing in recommendations and suggestions to further develop this subject.

The members of the committee are as follows: C. R. Wheeler (chairman), div. stkpr, B. & O.; G. P. Butcher, asst. gen. stkpr, N. & W.; W. A. Charles, asst. gen. stkpr, C.N.R.; J. S. Hayes, stkpr, B. & M.; D. L. Helsel, ch. clk., gen. store, S.P.; J. J. Kukis, div. stkpr, Erie; J. C. McLendon, div. stkpr, A.C.L.; D. H. Phebus, insp. stores, C.M.St.P. & P.; W. C. Replogle, ch. clk. to wks. stkpr, P.R.R.; C. H.

Shuart, mat. supv., A.T. & S.F.; C. E. Swanson, asst. gen. stkpr, C.B. & Q.; H. M. Rainie (chairman ex-officio), p.a., B. & M.

Discussion: Discussion entirely on the committee's suggestion that in shop manufacturing the labor costs be doubled, to make sure that the roads were not being misled into believing that shop manufacturing was profitable. It was decided that the paragraph be worded differently, to correspond more nearly with real cost finding.

- (j) Two months—district or regional accountant's office
- (k) Two months—general storekeeper's office
- (l) Two months—purchasing agent's office

This outline will not fit the organization of all railroads, but the committee believes the two-year total period is correct and adjustments can be made in detail by the individual railroad to fit its needs.

In each case of the specified locations, the trainee should be placed under the officer in charge, who should plan his stay in such manner as to give him a picture of the operation of the entire department, and should render a written report to the officer in charge of the purchasing and stores department covering his progress, with any pertinent recommendations.

Regardless of starting point, give every opportunity for the individual to learn all about the work in his immediate surroundings. Instill confidence in him by encouraging him to take greater responsibility and bear with him when he makes mistakes. Encourage him to take courses in any line of study that fits in with stores work to visit other storehouses on his own railroad as well as storehouses on other railroads.

Upon successful completion of the course, each graduate should be given an appropriate certificate by the proper officer.

Disposition of graduate: He should be considered for the first section storekeeper, stockman, or other suitable vacancy occurring after he receives his certificate. Further advancement should depend upon his ability.

No changes are recommended in the Purchasing and Stores Department Manual.

Following are members of the committee: L. H. Haynes (chairman), asst. genl. stkpr., S.A.L.; W. W. Shugarts (vice-chairman), asst. stores mgr., P.R.R.; J. H. Baker, ch. clk., pur. dept., C.P.R.; J. R. Beach, divn. stkpr., C. of Ga.; D. E. Dawson, genl. stkpr., G.M. & O.; J. F. Duffy, asst. mgr. stores, Erie; J. R. Fullerton, traveling stkpr., M.P.; E. R. Grinstead, ch. clk. to genl. stkpr., C.B. & Q.; K. P. Guin, genl. stkpr., Frisco; L. Kimer, genl. stkpr., C.N.R.; C. H. McGill, genl. stkpr., N.Y. N.H. & H.; F. McGrath, traveling stkpr., B. & M.; C. N. Thacker, stkpr., N.Y.C. & St. L.; J. W. Trump, dist. stkpr., Rdg.; C. E. Watson, asst. genl. stkpr., St. L.S.W.; W. O. Whitlow, matl. supv., A.T. & S.F.; F. Wood, genl. stkpr., C.M.St.P. & P.; V. N. Dawson, (chairman ex-officio), genl. stkpr., B. & O.

Discussion: O. A. Donagan, B.&M., expressed the fear that, once men were graduated from the course mentioned above, most roads would be hampered, by union agreements, in their efforts to give the men any "breaks." He also could not see that the unions would waive any of their privileges, in order for the railroads to make possible utilizing these men.

STORES DEPARTMENT ORGANIZATION, PRACTICES, RECORDS AND STOCK CONTROL

Stocks can best be controlled by following the recommended practice of using stock books or stock cards, classifying materials, inventorying regularly and ordering on the basis of an average consumption over a given period.

It is recommended that, in addition to the usual procedure of controlling materials, surveys be made on selected items or classes whose consumption appears out of line, based on the number of days' supply on hand, to determine the cause for the excessive stock, so that intelligent action can be taken to again bring it under control.

Such surveys should include a com-

reduction; and (9) classes of equipment and/or purpose for which used. Usually a survey of this kind made once a year will bring about the desired results if followed to a conclusion.

Physical checks in the field by stores representatives other than those in direct charge of storehouses will be of great benefit in disclosing stocks that are being held in excess of reasonable protection. They should be followed up and returned to the general storehouse or made available for transfer to other points to apply on requisitions.

Developing Stores Personnel.—A training program could be established as follows:

1. Purpose: To select and train younger personnel to qualify them to fill key positions in the purchasing and stores departments.
2. Candidates should be selected from the purchasing and stores departments in order to maintain the highest morale.
3. Qualifications:
 - (a) Good health.
 - (b) Good character.
 - (c) High school education, or equivalent.
 - (d) Not over 26 years of age.
 - (e) At least two years experience as a purchasing or stores department employee.
 - (f) Initiative and ability sufficient to secure the recommendation of his immediate superior officer.
4. Range of pay: Suggest an hourly starting rate above that of stores helper or junior clerk, such hourly rate to advance each six months until training is completed.
5. Length of training: two years.
6. Scope of Training:
 - (a) Two months—large engine house store
 - (b) Two months — locomotive back shop store
 - (c) Two months—freight car class repair shop store
 - (d) Two months—passenger car terminal store
 - (e) Two months—passenger car back shop store
 - (f) Two months—T. & T. and signal store
 - (g) Two months—M. of W. store
 - (h) Two months — reclamation and scrap handling
 - (i) Two months—district or regional storekeeper's office



L. H. Haynes,
Chairman

plete history, such as: (1) quantity on hand; (2) quantity due; (3) order and requisition reference; (4) total on hand and due; (5) quantity used during previous year; (6) average consumption based on this period or on some other period if conditions justify; (7) months' stock; (8) quantity to be disposed of to bring about the desired

EQUIPMENT AND SUPPLIES FOR DINING CARS, HOTELS AND COMMISSARIES



R. M. Schilling,
Chairman

It is the opinion of the committee that coal briquettes are not satisfactory for use in dining cars because of excessive soot and dirt and it is necessary to have a draft to burn properly. The difference in price of charkets is offset by the trouble the dining-car departments have with soot and dirt from coal briquettes clogging the flues.

The committee recommends that consideration be given to the use of Presto-Logs made from compressed sawdust in dining-car ranges, as they produce excellent heat without soot or dirt and require very little draft. The committee recommends the use of charkets for broilers. It also recommends the use of deep freeze to facilitate storage of a good supply of food and prevent spoilage.

Breakage and Loss.—A research committee of the Vitrified China Association at the Bureau of Standards in Washington is working on the problem of china breakage. Progress has been made, and it has standardized apparatus which permits it to duplicate each failure met with in service, and subject it to further investigation.

The committee has received advice from the American Institute of Laundering, Joliet, Illinois, that the use of a water repellent in the washing treatment has the advantage of preventing stains on linens and making the washing of linens easier. However, the fact that the linens are water repellent creates some difficulties. A liquid spilled on a tablecloth would not be absorbed and might run off and be spilled on a customer's clothing. Furthermore, absorption is a desirable quality in fabric used in napkins. The committee believes that the use of a water repellent

substance in the laundering of table linen would not be practical.

Purchasing and Stores Department Manual.—The committee recommends the following rule for insertion in the Purchasing and Stores Department Manual covering "Instructions for Handling of Commissary Supplies:

Instructions for Handling of Commissary Supplies.

Section No. 1—General.

(a) All supplies and equipment will be requisitioned by the commissary storekeeper, approved by his superior officer, based on estimate of consumption.

(b) Purchases of supplies and equipments from points nearest consuming handled by the purchasing department.

(c) Prices of various items based on brands, quality, deliveries and shipments from points nearest consuming localities, to govern.

Section No. 2—Storing and Handling.

Stock books should be maintained covering standard stock items listed under the standard material classification No. 41—Commissary Supplies for Dining Cars and Restaurants.

Commissary stock items should be grouped into several subclasses as follows:

41-A—Grocery Supplies, such as canned, packaged and bulk items.

41-B—Perishables, such as meat, poultry, fish, oysters, fruit, vegetables, bread, pastry and daily products.

41-C—Wines, liquors and beverages.

41-D—Cigars, cigarettes.

41-E—Equipment, consisting of kitchen and pantry items cooking utensils

used in food preparation, china, glassware and silverware.

41-F—Linen, all textiles.

41-G—Miscellaneous.

All items on hand should be counted and recorded monthly in the stock books and purchase requisitions should be made based on consumption and quantities on hand.

Purchase requisitions after being checked and approved should go to commissary agent in the purchasing department.

Perishable items should be requested daily from the commissary store to the purchasing department.

Section No. 3—Purchasing.

All purchases of commissary supplies should be handled by the purchasing department. The buyers are in constant contact with companies and suppliers as regards to prices and deliveries and place orders for supplies on monthly, semi-monthly and yearly orders for deliveries to the various commissary storehouses.

Perishable items are handled daily by the purchasing department and orders are placed with various suppliers based on quality and prices for daily deliveries that require refrigeration to keep spoilage and loss to a minimum.

Following are the members of the committee: R. M. Schilling (chairman), asst. to g.p.a., N.Y.C.; E. A. Bromley, g.p.a., C.N.R.; H. W. Concannon, asst. genl. stkr., S.P.; E. L. Downey, commissary buyer I.C.; L. V. Hyatt, commissary buyer, M.P.; T. Q. Quirk, asst. p.a., C.P.R.; D. McK. Ford, (chairman ex-officio) v-p., C.N.R.

Discussion: C. F. Bayer, D.L.&W., suggested this committee, in the future, have a representative of the dining car superintendents sit in on its meetings, since there was much in common, and some antipathy, in the viewpoints of the two groups.

CAPACITY LOADING AND PROMPT HANDLING

Use of revenue cars for company materials should be curtailed and non-revenue ton-miles reduced

We are all very much aware of the continued critical freight car shortage. This makes it imperative that revenue cars loaded with company material be reduced to an absolute minimum and that those which are used be released and returned to service with the least possible delay.

Attention is directed to a statement from W. T. Faricy, president of the A.A.R., that during October, 1947, the average turn-around time of railroad freight cars was shorter than ever before, 12.4 days or one-half day better than the previous record. This reduction is equivalent to adding 80,000

freight cars to the available supply. The performance for November was 13.5; December, 14.9; January, 1948, 15.5 and February, 15.3. These figures, of course, do not reflect any lost ground in connection with performance but are due to seasonal loadings and weather conditions. All the railroads should make, and we think are making, their contribution to this record.

Your committee realizes that a very considerable part of this tonnage is fuel, solid and liquid; however, if the transportation of fuel was eliminated, the figures would still be large enough to warrant careful study of ways to

reduce non-revenue ton-miles on each railroad, and the following factors should be given serious consideration:

1. Are purchases being made in such a way that the "free haul" cost is given sufficient study in the award of business?

2. Are storehouses located so as to



C. C. Daughtridge,
Chairman

provide a minimum amount of free haul consistent with approved stores practice?

3. Whenever possible are shipments made direct from manufacturer to the point where material will be used?

4. Is the distribution of material from storehouses made in the most efficient way?

Use of Ferry Cars and Trucks.—Due to the critical situation and the shortage of freight cars of all kinds for commercial loadings, in an effort to conserve equipment during the present emergency, some of the railroads have been giving consideration to the use of trucks in handling l.c.l. company freight from freight house to storehouses in lieu of using commercial cars; and, where volume justifies, cars not suitable for commercial loading should be assigned to shuttle service between freight-house and storehouses.

By Interstate Commerce Commission order, the per diem rate on freight cars was increased effective September 1, 1947, to \$1.50 per day. This is a substantial increase over the former rate; and, unless offset by every possible means, will radically increase railroad car hire expense. Railroads should all work to program the use of system cars in local and system service and foreign cars for off-line loading in home direction.

Capacity Loading.—Maintain a shipping schedule to other stores that is up-to-date, but flexible enough to justify capacity loading. Cars that are not on regular shipping schedule should be handled in the same manner. Where tonnage is not sufficient, twin or multi-

ple loads should be made, but loading should be done so that the contents for the first consignee are placed in the car in such a position that they can be unloaded without making necessary handling of other shipments.

The first requisite for properly spotting cars for unloading is a knowledge of the contents; and, to know this, it is necessary for the shipper to furnish the consignee a shipping list in advance of the arrival of the car in the terminal. With this information, the party preparing a switch list will have little trouble spotting the car at exact location.

The increasing use of modern power material-handling equipment and devices is now playing an important part in expediting the loading and unloading of cars. The expanding use of the fork truck and the pallet and skid system of loading, unloading and storing material has greatly reduced time consumed loading and unloading freight cars.

It is also important that proper arrangements be made with the shipper to load materials in cars properly arranged, by banding, strapping or palletizing, in order that they can be unloaded with cranes and lift trucks with the least possible effort. Improper loading consumes unnecessary time for unloading. Close contact with the using departments will often prevent delay to cars loaded with company material. Work schedules are constantly changing, thus altering material demands.

Stores men should assist car-department forces in holding the number of bad order cars to an absolute minimum by exerting concentrated effort to have material on hand to enable repair forces to make necessary repairs in the quickest possible time.

We cannot discount the value of a complete car record, showing date of arrival in the terminal, date delivered to shops or store, date and time spotted for unloading, date released and ordered switched from shops or store. A complete record removes the possibility of overlooking a car and causing delay. This record usually goes to the superintendent and chief purchasing officer with an explanation of any delays, and all parties responsible for loading and unloading cars are made aware of the importance of the information.

Adequate storage facilities should be available at receiving points to avoid unnecessary holding of cars.

The members of the committee are as follows: C. C. Daughtridge (chairman), asst. div. stkpr., A.C.L.; J. C. McCaughan (vice-chairman), gen. stkpr., C. & O.; G. W. Higdon, gen. stkpr., G.C.L.; P. L. Jenkins, stkpr., N. & W.; W. P. Kimpel, stkpr., Erie; J. K. McCann, dist. stkpr., C.B. & Q.; J. E. Mills, trv. stkpr., M.E.C.; C. J. Pearce, asst. gen. stkpr., S.P.; F. R. Schwartz, p.a. and stkpr., A.T. & S.F.; L. G. Wiley, stkpr., Altoona car shop, P.R.R.; G. E. Wilson (chairman ex-officio), mgr. stores, Reading.

SIMPLIFICATION AND STANDARDIZATION OF STORES STOCK

In 1941 this committee made a study of the use of brake pins and brake-pin bushings, and submitted simplified lists of sizes.

This was referred to the Mechanical Division and in view of reports submitted, it is the recommendation of the committee that no changes should be made in those lists and that the railroads endeavor to confine their orders to the sizes shown.

Class 42, brazing fittings, was referred to the Mechanical Division in 1945 and is being studied by one of its committees. The committee feels that the matter is of sufficient importance to keep active, and is awaiting a report from the Mechanical Division before taking further action.

The standard sizes of copper tubing, Class 14-3, recommended by this committee and adopted by the Mechanical Division in 1938, should be reconsidered at this time. Copies of simplified practice recommendations from the United States Department of Commerce have been forwarded to that division and its recommendations have been requested

for possible further action by our committee.

The committee recommends that the following sizes of Buttonhead Rivets, Class 11-3, be removed from the standard Material List due to the small quantity involved and the few railroads using them:

$\frac{3}{4}$ by $\frac{7}{8}$ in.
 $\frac{1}{2}$ by $\frac{7}{8}$ in.
1 by $2\frac{3}{4}$ in.

The following sizes of Conehead Rivets, Class 11-4, should be added to Standard Material Lists:

Size in.	No. of Railroads using	Annual Consumption (lb.)
$\frac{3}{4}$ by 1	14	4,474
$\frac{1}{2}$ by $1\frac{1}{2}$	13	23,174
$\frac{1}{2}$ by $1\frac{5}{8}$	5	6,387
1 by 7	9	2,608
$\frac{3}{8}$ by $7\frac{1}{4}$	6	16,512
$\frac{3}{8}$ by $7\frac{3}{4}$	6	69,018
$\frac{13}{16}$ by 9	7	11,587
$\frac{13}{16}$ by 9	6	12,257

Some 73 railroads reported that they are using 221 sizes of conehead rivets not shown on the Standard Material Lists, not one size of which is used by more than five railroads. The total weight of the annual consumption of these 221 sizes in 184,017 lb., or an average of 832 lb. per size, or 5 per

cent of the total annual consumption of 3¾ million lb.

This study appears to warrant the recommendation that the individual roads make a study of their stock sizes in an effort to effect considerable re-



W. H. Lloyd,
Chairman

ductions in the number of sizes carried. Consideration may be given to further recommending that the individual roads use buttonhead rivets instead of conehead. Thirteen of the 73 roads reporting do not use conehead rivets at all.

The 1938 revision of the Standard Material List, corresponding to Division V list adopted in 1937, shows 24 sizes of copper flue ferrules, Class 14-1, as recommended standard sizes. This list shows 8 inside diameters with 3 wall thicknesses. Due to little usage it was recommended that ferrules of 2.125 in. inside diameter, and of No. 11 gage (.125 in. thick) be dropped from the list.

These changes will result in a list of 7 inside diameters each of two wall thicknesses and two standard lengths, a total of 28 sizes. Adherence to these sizes should cover most, if not all, reasonable requirements, and permit manufacture in large quantities, at lower prices.

It is recommended that the electrode comparison chart on classification numbers as shown by the A.W.S. and the N.E.M.A. standards be included in the Standard Material Lists.

Investigation indicates that little can be done at present towards elimination of "extra," on Class 15, iron and steel products. Attention is directed to the large number of "extras" appearing in the steel products price lists. These extra charges are for other than standard specifications—exact lengths, odd sizes, marking identification and small quantities.

Many of these extras can be eliminated if each railroad will review its stock records with the object of bringing specifications in line with the Amer-

ican Iron & Steel Institute's Standard Practice Manual.

The committee has agreed to accept the recommendations made as a result of meetings between the A.A.R. and the manufacturers of railroad communications equipment, that the following 10 vacuum tubes, Class 2, be considered for ruggedization and adoption as a preferred list for use in railroad communication, for both land and mobile stations.

1. 6AK5—Pentode
2. 6BA6—Pentode
3. 6AS6—Pentode
4. 2C51—Double Triode
5. 6AL5—Double Diode
6. A power amplifier (similar to 6AQ5) having a power output of at least 2.5 watts, on a 9-pin miniature base and good for RE, to 160 Mc.
7. 2D21—Thyratron.
8. A twin triode having a mu of about 70.
9. OA2W—Voltage regulator.
10. 5R4WGY—Rectifier.

As an item of interest, mention is made that one large manufacturer is now producing three special tubes for industrial application, where 10,000-hour life, rugged construction, uniformity, and stability are paramount. These tubes are referred to as follows:

Special Tubes Type No.	Class of Tube	Electrical Character similar to:
5691	High mu twin triode	6SL7-GT
5692	medium-mu twin-triode	6SN7-GT
5693	sharp cutoff pentode	6SJ7

New Subjects Considered.—Confidential information has been obtained by this committee and is available in the office of the executive vice-chairman, consisting of studies that have been made concerning the identification of ball bearings applying to different designations being used by the various manufacturers.

It is recommended that this subject be given further study by this committee toward possible simplified standards. It is the opinion and recommendation of the committee that all ball bearings be carried under one A.A.R. classification 45-A.

The following suggestions were made by the committee and referred to committee Subject 5—Forest Products:

Car siding and car lining have for some time past been supplied in various grades, widths, and lengths, and because of lumber scarcity, some of this material—regardless of grade—has had to be used for either one or the other purpose, i.e., the best grades have at times been used for siding and the remaining poor grades for lining.

It has been suggested, to avoid a duplication of stock, that the lining pattern be eliminated entirely and all siding and lining be machined to the siding pattern. This will permit its use as either siding or lining, the latter with the "V" siding pattern to be reversed when it is used as box car lining.

It is further recommended that consideration be given also to the use of this grade of siding as flooring for buildings.

It has been disclosed that one rail-

road's standard on flooring and siding is net 25/32 in. by 3¾ in., and that they often substitute siding for flooring by reversing the "V" pattern.

It is the opinion of the committee that this is an item of importance and that economies can be affected through the adoption of this practice.

Section V

New Subjects for 1948 Committee
Class 11-8—Weathertight bolts
Class 26—Wool skeins and pads
Class 45-A-8—Self-tapping screws
Class 45-A-6-7—Phillips head screws
Class 46—"V" belts, endless
Class 47—Glass, all kinds

It is the committee's definite opinion and recommendation, borne out by actual experience of members, that many advantages in stock reduction may be realized through close adherence to the simplified Material Lists of recommended sizes. It is also this committee's opinion that closer cooperation could be maintained between the purchasing and stores and the using departments, with considerable savings in materials possible.

Following are members of the committee: W. H. Lloyd (chairman), gen. stkpr., C.R.I. — P.; R. W. Hall (vice-chairman), traveling stkpr., L. & N.; E. F. Chubb, asst. gen. stkpr., P.R.R.; T. J. Clancy, dist. stkpr., G. N.; A. H. Evans, asst. mgr. stores, C.P.R.; L. E. Field, supv. matl. standards, B. & M.; G. H. Flagg, supv. matls., B. & O.; J. B. Fraser, genl. stkpr., C.N.R.; C. R. Holmes, genl. Stkpr., A.T. & S.F.; C. A. Hoover, divn. stkpr., Sou.; G. J. House, class. inspr., Erie; J. C. Marchand, p.a., W.P.; H. C. Ralls, asst. genl. stkpr., M.P.; C. E. Woodson, sect. stkpr., N. & W.; A. H. Young, ch. clk. to genl. stkpr., C. & O.; J. L. Quarles, (chairman ex-officio), supt. stores, C. & O.

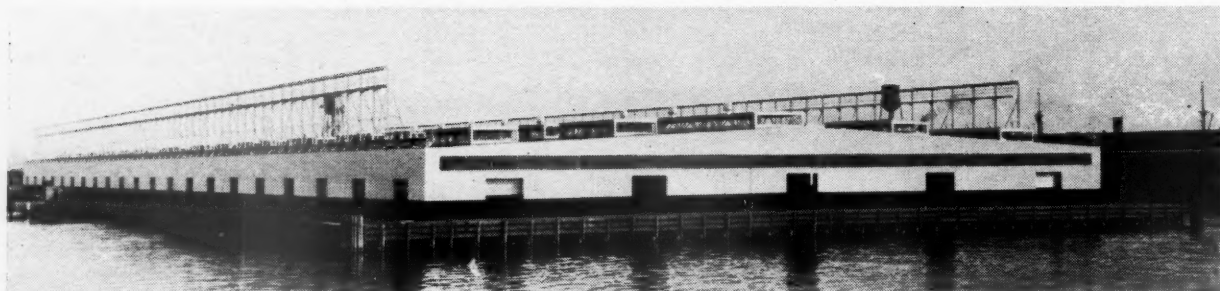
Discussion: F. J. Steinberger, Santa Fe, said the report was a good one but thought there were larger items to be attacked. For instance, failure to standardize tie plate punchings had led to the steel men doing it, with the result that deviation in location or size of punching was now costing two cents per deviation, meaning as much as \$8 per ton.

On the major railroads he found six different widths of baggage truck, ranging from 36 in. to 46 in.; seven different heights with a range of from 27 to 37 in.; wheels from 22 in. to 28 in. diameter and from 3 in. to 4 in. diameter. These differences were costing the railroads money.

In journal packing he found great differences, while roads using the best got paid just the same for packing foreign cars with good material as if they used the poorest grade.

Mr. Steinberger suggested a joint committee of P.&S., Mechanical and Engineering men to study standardization.

C. B. Neubauer, Sou., suggested a tie of some sort between A.A.R. and A.S.T.M. specifications of steel.



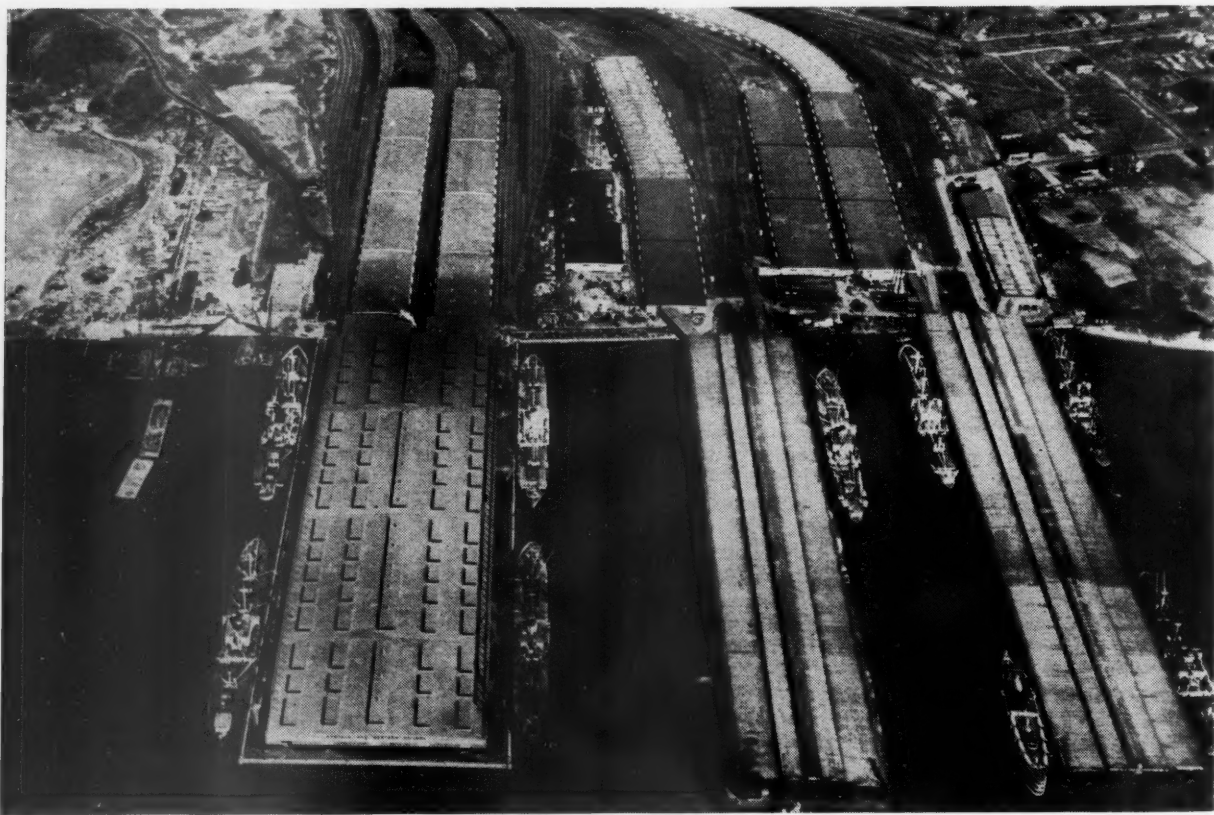
The new pier of the N. & W. at Lamberts Point, Va., as seen from the outshore end

BUILDS LARGE TIDEWATER PIER AT NORFOLK

Norfolk & Western facility, with supporting warehouses and yards, permits rapid handling of cargo and can accommodate four merchant vessels simultaneously

At Norfolk, Va., its eastern terminal, the Norfolk & Western recently completed and placed in service a new merchandise pier, said to be the largest single-deck pier on the Atlantic seaboard and one of the

largest of this type in the world. Together with two new supporting warehouses located immediately adjacent to its inshore end, and a new supporting yard of 535 cars capacity, the pier enables the N. & W. to



Aerial view of the N. & W.'s merchandise piers at Lamberts Point. The new facilities—Pier "N," Warehouses "H" and "J" and their supporting trackage—are shown at the left. The older piers, warehouses and yards are at the right

make a strong bid for increased export, import and coastwise business at the port of Norfolk. Built at a cost of more than \$6,000,000, the pier and its related facilities are evidence of the N. & W.'s faith in the continuing and growing importance of the port of Norfolk, and supplement the road's other port facilities at this point, which include four merchandise piers, two coal piers, and a 750,000-bushel grain elevator.

Pier Is 1,100 Ft. Long

The new structure, designated as Pier "N", is of the covered type and is 1,100 ft. long and 390 ft. wide—large enough to accommodate four 10,000-ton merchant vessels at one time. It is located at Lamberts Point on the east bank of the Elizabeth river, about one mile above the point where that stream flows into the famous anchorage known as Hampton Roads. The pier extends westwardly into the river, with its south edge parallel with and 310 ft. north of an existing pier, known as Pier "L." The pier shed is somewhat smaller than the pier itself, being 1,050 ft. long and 320 ft. wide, and is so located as to provide for a 35-ft. apron on each side and a 25-ft. apron at each end.

The deck of the pier is of concrete, with a one-inch asphalt wearing surface, and is supported on precast piles.

Two depressed tracks are located along the center of the pier, stubbing at the west end of the shed, while four other tracks are provided on the aprons at deck level, two being located on each side apron.

The shed frame is of steel construction, with galvanized corrugated-steel sheathing. The roof is of Holorib metal, covered with asphalt insulating board and Barrett 20-year built-up roofing.

Access to the shed is obtained by a total of 52 doorways spaced at intervals of approximately 50 ft. on the sides and ends, the openings generally being 14 ft. high by 15 ft. wide. A larger door, 22 ft. high by 27 ft. wide, is located at the center of the shore end to accommodate freight cars entering on the depressed tracks. All doorways are equipped with Wilson electrically operated rolling steel doors.

Extending above each side of the pier shed is a line of Burton tackle or cargo masts, which facilitate the transfer of freight between the pier and vessels. The cargo masts on the south side are supplemented by two 15-ton American revolving gantry cranes, and provision has been made for installing a pair of similar cranes on the north side if this should later prove desirable. Four electric winches are located on each of the side aprons for use in moving cars.

Shed Has Large Storage Area

The interior of the shed presents a broad expanse of storage space—nearly 7.7 acres—unbroken except for the depressed tracks and four longitudinal lines of roof-supporting columns, four offices for cargo checkers and tallymen, and several small shelters for housing the control equipment of an automatic sprinkler system. The offices are of cinderblock construction, with concrete roof slabs, and are 6 ft. by 15 ft., two being located on each side of the depressed tracks. The valve

houses are of similar construction and, in general, are 6 ft. by 7 ft.

Electrically operated vertical-lift bridges are provided at two locations in the shed to span the depressed tracks. When not in use these are housed in the roof structure, but, when necessary, they can be lowered to bridge the tracks and thus facilitate the handling of freight from one side of the pier to the other.

Daylighting of the shed is furnished by a series of fixed-sash monitors arranged in five longitudinal rows above the roof. These are supplemented by continuous panels of glass block, 5½ ft. high, extending across both ends of the shed above the doors. Ventilation is afforded by the open doorways and by a number of metal ventilators above the center line of the building. Night and supplemental lighting of the shed is by 780 incandescent drop lights.

An extensive automatic sprinkler system of the dry-pipe type has been installed in the shed. To minimize further the danger of fires spreading, the shed roof is divided into seven sections by means of metal fire curtains, or "draft stops," which extend from the roof deck down to the bottom chords of the roof trusses. Other fire protection is provided by a high-pressure water supply with numerous hydrants and fire-boat connections.

Seventy Miles of Piles

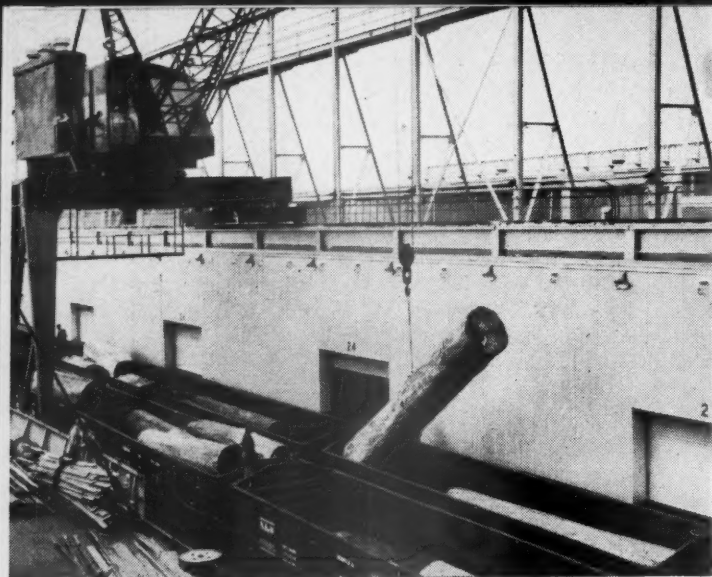
A total of 5,400 precast concrete piles were used in constructing the pier. Of these, 3,450 were 18 in. square, while 1,950 were 20 in. square. Both sections were tapered at the bottom four feet to form an 8-in. by 20-in. or 8-in. by 18-in. chisel point. The piles varied from 50 ft. to 80 ft. in length and if laid end to end would have a total length of nearly 70 miles.

The piles were cast at a convenient location near the pier, while the mixing plant was located midway between the casting yard and the pier. Two Koehring 34-E dual-drum mixers were used on the project, so arranged as to feed a Rex 200 double Pumpcrete machine, which pumped the concrete through an eight-inch line to the pile yard where it was distributed to the forms in buggies.

Concrete for the piles was essentially a 1:2:3 mix designed for 4,000-lb. strength. To increase the workability of the mix and the durability of the finished concrete, 1 lb. of the Master Builders Company's Pozzoloth was added for each sack of cement.

After curing for 14 days, the piles were loaded on barges for delivery to points of use. Handling was by means of a locomotive crane through a steel beam "strongback," with a number of adjustable lifting clamps. The driving rigs were two barge-mounted, 25-ton Wiley-Whirley cranes with 85-ft. booms. The piles under the shed section of the pier deck were driven on 10-ft. centers, transversely and longitudinally, except for a four-pile cluster at each column location. Beneath the aprons and the center track, the piles were driven in bents, 20 ft. apart longitudinally, with the piles in each bent located between 3 ft. 6 in. and 6 ft. 9 in. apart.

Trussed-beam steel templates up to 98 ft. in length were used to position the piles for driving. These had properly spaced pockets into which the piles were inserted. When a template was properly aligned, all piles



Unloading pulpwood with one of the American 15-ton gantry cranes



Construction view of the new pier. All concrete for the deck was pumped through the eight-inch line shown in center

The interior of the pier shed has nearly 7.7 acres of storage space



for that portion of a bent were set up in the template pockets, after which they were jettied to within two to five feet of grade. Then they were hammer-driven to 50-ton bearing. Driving was carried out in seven sections across the pier, each section being carried forward about 10 bents before the adjacent section was driven. The piles were driven with a McKiernan-Terry pile hammer especially designed for use on this project.

The deck concrete was also delivered by the Pump-concrete machine, through an elevated line which enabled it to be chuted to all parts of the slab. Mall vibrators were used to work the concrete around the reinforcing.

The deck concrete totaled 24,200 cu. yd. and, like the pile concrete, contained 1 lb. of Pozzolith per sack of cement. The mixture in this case was roughly 1:2½:3½. As already pointed out, the deck has an asphalt wearing surface, except for a 2-ft. strip around the periphery of the pier and around the depressed-track area, which was coated with Master Builders Masterplate finish.

Warehouses Supplement Pier

The new warehouses that form an important part of the pier project are located 80 ft. directly inshore from the pier and are connected to it by two covered passages. Designated as warehouses "H" and "J," these are each 108 ft. wide and 1,008 ft. long. An open space 54 ft. wide separates the warehouses, and in this space are four tracks. The two outside ones are adjacent to and serve the warehouses, being stubbed at the pier ends of these buildings, while the two inside tracks continue beyond the warehouses to become the depressed tracks on the pier. Each warehouse is also served by an additional track, located on the opposite side of the building from the tracks just mentioned, these also being stubbed at the west line of the warehouses.

The warehouses are founded on creosoted timber piles, 40 ft. to 70 ft. in length, which were treated by the Atlantic Creosoting Company, South Norfolk, Va. The side walls are of slag-block construction, painted with two coats of Bondex. Double sliding doors, 23 in number, are placed at 42-ft. intervals along both sides of each house. These are numbered for convenience in spotting cars and in storing goods at the proper locations.

The floors are of concrete with a steel-trowel finish. There are two asphalt driveways, 12 ft. wide, in each warehouse, one being located near each of the long walls.

The warehouses are divided longitudinally into four sections, each approximately 250 ft. long, by reinforced concrete fire walls. Openings in the walls for each of the driveways are equipped with automatic double fire doors. Like the piers, the warehouses are protected by a dry-pipe automatic sprinkler system.

Yard Accommodates 535 Cars

The new 535-car yard constructed as part of the pier project has 19 tracks. This yard is divided into two sections, which flank the new warehouses. While intended primarily to serve Pier N and warehouses H and J, the new yard supplements and is actually

part of an existing yard which serves the entire merchandise-pier area. The total capacity of the enlarged yard is 1,440 cars.

Dredging Project Involved

Part of the new section of the yard occupies a former channel known as Lambert Creek canal, which was primarily a drainage canal. About 2,000 ft. of this canal was relocated north of the new yard and pier area and now flows through a double box culvert, with two 8-ft. by 6-ft. openings. The old channel was filled with sand dredged from the river more than a half-mile away. To avoid interfering with yard operations, the pipe line for transporting the sand was carried over the tops of several warehouses and a number of yard tracks.

Another important dredging project was that of excavating new channels adjacent to the piers. The 310-ft. slip between Pier N and Pier L was deepened to a uniform depth of 35 ft. below mean low water, while a new slip was provided on the north side of the new pier, 35 ft. deep and 200 ft. wide. Beyond this new slip the bottom was sloped upward at the rate of $3\frac{1}{2}$ to 1 to the natural bottom level, which is about 5 ft. below low water. The new channels were carried beyond the end of the pier to meet the main channel of the river. All dredging was done by the Norfolk Dredging Company. The material from the channel dredging was not suitable for filling purposes and was wasted in a spoil area north of the pier.

Other New Port Facilities

Smaller units in the pier project include a stevedores' gear house, garage and repair shop, a fumigating plant, a cafeteria building, roadway approaches, and a 100,000-gal. elevated tank for fire protection, local water supply and ship-watering purposes.

The fumigating plant is for fumigating cotton from Egypt, India and China, and other commodities that require this treatment at the port of importation. It consists of four chambers, each 6 ft. by 67 ft., by 9 ft. high of 5/8-in. steel-plate construction, in which the goods are subjected for three hours to hydrocyanic gas under pressure.

This equipment was furnished by Pottstown Metal Products Company, Pottstown, Pa., and was designed by Henry E. Byer, engineer, Hoboken, N. J.

All of the N. & W.'s freight-classification operations at Norfolk are carried out at Lamberts Point yard, immediately adjacent to the pier area. Road freight trains pull into the main yard, where the cars are classified as to pier destination or for storage to await the arrival of designated vessels. Final classification of merchandise cars is done at the yard in the pier area.

Leased to Dock Company

Pier N and the other merchandise piers of the N. & W. at Norfolk are leased to Lamberts Point Docks, Inc., which performs all of the stevedore work. For this purpose, the dock company employs a large number of trailers hauled by Towmotors. This company also makes extensive use of Clark forklift trucks, many of



A specially-adapted lift truck handling hogsheads of tobacco

which are specially adapted for handling large casks of tobacco.

Pier N and its related facilities were designed and built under the general direction of W. P. Wiltsee, chief engineer of the N. & W., until his retirement on June 1, and A. B. Stone, at the time assistant chief engineer, and now chief engineer. The pier was built by the McClean Contracting Company, Baltimore, Md., which company also constructed the foundations and decks of the warehouses. The warehouse buildings were erected by John P. Pettyjohn & Co., Lynchburg, Va. J. Y. Neal, at the time assistant engineer of the N. & W., and now principal assistant engineer, was in direct charge of construction.



A standard Twin Coach passenger bus converted for use on rails on the Houston North Shore, a Missouri Pacific subsidiary

ACCOUNTING OFFICERS SEEN AS MANAGEMENT'S TOOLMAKERS

Faricy and Woodruff among speakers at annual meeting of A.A.R. division where program emphasized how modern methods will cut accounting-department costs while continuing to supply executives with all necessary information

Accounting officers attending the annual meeting of the Accounting Division of the Association of American Railroads at Cleveland, Ohio, last week participated in a program which emphasized how modern methods will cut their own departmental costs while at the same time supplying top management with an increasing amount of the timely information it requires to protect revenues, control expenses, and implement public relations programs. Foremost among the modern methods under discussion were developments in connection with the mechanization of accounting work; and in that connection there were practical demonstrations at hand in the exhibit staged by manufacturers of office machines, equipment and supplies.

Principal speakers at the meeting were President William T. Faricy of the A.A.R., who asserted that the investors' share of railroad revenues "must become greater than it is today," and called for accounting-department enterprise in the development of "budgetary controls which really control" and thus insure that a larger proportion of the gross finds its way into net; President R. E. Woodruff of the Erie, who expressed his hope of enlisting the aid of accounting officers in management's undertaking to tell the story of the railroads and the American free-enterprise system in understandable language to employees and the public; George O. May, consulting associate of Price Waterhouse & Co., who discussed accounting developments since 1940, advocating that railroad depreciation accounting be placed on the so-called last-in-first-out basis to insure that revenues provide for the replacements of exhausted property in these times when "stability of the monetary unit is no longer even a major purpose of national policy"; and A.A.R. Vice-President E. H. Bunnell, whose address on "Accounting Research" was a progress report on the work of the division's special accounting committee on research which was created in 1946 as a subcommittee of the general committee.

The 54th Meeting

The convention, the 54th annual meeting of railway accounting officers, was held from June 28 through July 1 at the Hotel Cleveland and attended by 787 members and guests. Presiding was the division's chairman, T. J. Tobin, comptroller of the Erie, who also acted as chairman of the committee on arrangements for the meeting. In the customary chairman's address, Mr. Tobin called railroad accounting departments "veritable storehouses of facts," and urged the assembled accounting officers to see that these facts—"the tools which management requires"—are

served to top executives and other departments in usable form. Other proceedings of the meeting included informal talks by representatives of the Interstate Commerce Commission and other government departments and addresses by members who discussed accounting subjects suggested by reports of some of the division's standing committees.

In the annual election held at the meeting's closing session, R. E. Connolly, vice-president of the Illinois Central, was elected chairman to succeed Mr. Tobin. Mr. Connolly had been first vice-chairman. George F. Glacy, comptroller of the Boston & Maine was likewise moved up from the second to the first vice-chairmanship, and I. V. Jessee, comptroller of the Norfolk & Western, was elected second vice-chairman. This slate had been unanimously recommended in the report of the nominating committee of which E. M. Thomas, vice-president of the New York, Chicago & St. Louis, was chairman. E. R. Ford continues as secretary. The choice of a time and place for the next annual meeting was left to the general committee.

A.A.R. President Faricy, in his address, looked at the situation "in a broad way" and identified "three partners in this railroad enterprise"—the general public, railroad employees, and railroad investors. He cited the industry's performance in the war and postwar period as evidence of its ability and determination to meet the public's demands for its services; and he found that railroad employees "have fared well" with the purchasing power of their current earnings greater than that of their 1939 earnings and their retirement system "unparalleled anywhere in the world."

Management Responsibility to Investors

To the third partner, the investor who supplies the wheels that are made "go round," Mr. Faricy said management has one of its "greatest responsibilities." He went on to tell the accounting officers that he and they could never regard themselves as "completely successful" in their roles of management representatives until the railroads are in a "comfortable financial position." And Mr. Faricy does not regard the current financial situation as comfortable. He predicted that the 1948 gross may reach a record total of \$10 billion, but the net income will be less than that of 1929 when the gross amounted to \$6.3 billion or less than two-thirds of that in prospect to 1948.

The A.A.R. president anticipated that the 1948 net income would amount to about \$650 million or the equivalent of 6½ cents per dollar of gross. He contrasted this with 1929's net of \$897 million, or the equivalent of 14 1/3 cents per dollar of gross. He

emphasized that the 1948 figure of 6½ cents in net income per dollar of gross "is not to be confused with the rate of return on investment." The latter, **Mr. Faricy calculated**, would be about 4¼ per cent for 1948; and he called this "insufficient to attract the inflow of new investment which we should have if the railroads are to continue to make the improvements necessary to keep themselves abreast of national needs."

Noting how costs of railroad operation have increased "at a much faster pace than have rates for transportation services," Mr. Faricy warned that the end of the rising-cost trend may not have been reached. He mentioned the new wage demands, a granting of which would "aggravate the already serious financial problem."

A "Priceless Economic Asset"

"Here," the A.A.R. president continued, "is where the public should be aroused to a recognition of the fact that the railroads are not simply an aggregate of private enterprises to be regulated as a measure of protection to the public. There must be public appreciation of the fact that the railroads constitute a priceless economic asset and an important arm of our national defense, to be preserved and permitted to prosper in the public interest."

"It is evident to any thoughtful observer that only a financially stable industry can produce low-cost transportation. Lower costs can be attained only through improved operating methods and technological progress. These beneficial developments can be had only through plant improvements which cost large sums, and such funds cannot be had unless the railroads can earn them or attract them as investments. To accomplish low cost transportation, earnings must come first. Lower transportation costs and still more efficient service will follow."

President Woodruff of the Erie, as he put it, spoke to the accounting officers "as Americans." He denied that America's private-enterprise system is "on trial," as is often said. As Mr. Woodruff sees it, communism and socialism are on trial—the American system "has demonstrated that it works." The Erie's president found that the success of the private-enterprise system lies in production made possible by the development of machines to do an increasing amount of work formerly done by manual labor. He pointed out that, to get these machines, "somebody had to save money," and thus "profits after taxes are essential."

Calls for "Paul Reveres"

People who have been advocating that we go "the English way" to socialism have not been taught "the economic facts of life," Mr. Woodruff said. He does not think that will happen here if the people are kept properly informed. Thus he urged the accounting officers to become "Paul Reveres," sounding again the alarm that the "British are coming." Mr. Woodruff's specific recommendation in that connection was that the widest possible circulation be given the article on "The Free Enterprise System," which was written by Phelps Adams, chief of the New York Sun's Washington Bureau, and which has been reprinted in con-

densed form by the A.A.R. Public Relations Department for distribution by member roads.

Mr. Woodruff called the article the "best primer on private enterprise" which he has seen. "We have a job to do in this country," he added, "We've done a wonderful job of production, but a perfectly lousy job of telling our own people about it."

The Erie president also told the accounting officers that they have a vital part in preparing this educational material. He went on to advise that it can't be done in "accounting language," because the job is one of telling the public and railroad employees the facts about the industry in "language they can understand." By way of example, he suggested that financial reports may be misleading when they publish gross figures for revenues, expenses, and net income; in his opinion, the earnings should be stated on such bases as return on capital and per share of stock.

Mr. May had spoken at the division's 1940 annual meeting at White Sulphur Springs, W. Va., and his present address was a discussion of major accounting developments since that time as they affect the railroads. He listed such developments as the change in the character and value of money; the I.C.C. decision in the Chicago Great Western case (Ex Parte No. 138) which "laid down the principle that the aggregate recorded values of depreciable capital assets might exceed the values assigned to the assets in fixing the permissible capitalization of a reorganized railroad . . . this excess to be carried to an acquisition adjustment account, the future disposition of which was left largely to future action of the commission"; the I.C.C. order requiring depreciation on road facilities which became effective January 1, 1943; and the expedited amortization of facilities as permitted during the war under special provisions of the Internal Revenue Code.

Before getting into his advocacy of the last-in-first-out basis for depreciation accounting, Mr. May recalled that he had opposed the extension of depreciation to road items, recommending instead "a system of renewal and replacement reserves . . . designed to make the maintenance charges for any year reflect as accurately as possible the exhaustion of property during the year converted into money on the basis of the price level of the year." He also quoted from the Great Western decision commission comment which seemed to him to point "clearly to the inadequacy of charges for exhaustion based on original cost."

Original-Cost Depreciation Inadequate

"Today," Mr. May added, "replacements which do no more than maintain the enterprise result in heavy charges to capital because of the inadequacy of depreciation based on costs to meet corresponding costs at today's much higher price level. . . . The steady rise in prices has, of course, impaired the real worth of all investments. I think this development was inevitable and from a social standpoint it is probably desirable; in any case it is likely to continue. I believe, however, that it has made imperative measurements of income in which the positive and negative elements are expressed in terms of units of approximately the same purchasing power. That is quite a different question

from that of using reproduction cost as the rate base.

"In expressing this view, I am accepting the assumption that the accounting and regulation of railroads is to be governed by the prudent investment theory. Early in the century, as the result of an extensive study of this question which I had occasion to make, I concluded that this theory was best fitted to our economic and political system."

The last-in-first-out system (LIFO) was described by Mr. May as that which "calls for charging against the proceeds of sale of goods the cost of the last units purchased rather than the cost of those first acquired." If LIFO be viewed as a system which attempts "to bring costs and revenues into account on substantially the same price levels," as he thinks it will, Mr. May suggested that "the implications are far-reaching." The argument for the application of LIFO to depreciation accounting, he explained, contends that "depreciable capital assets are now recognized as in reality long-term inventories and that owners of them are entitled to at least as favorable treatment of such assets in tax accounting as is accorded to short-term inventories. Mr. May noted that the question has become controversial, but he did not think the controversial aspects would arise in relation to the railroads.

LIFO Non-Controversial as to Railroads

"The controversial question," he said, "is whether the charge for the cost of replacement should be met before or after determining net income for financial and tax accounting purposes. This question is vitally important in the case of industries whose profits are not regulated. It takes an entirely different aspect in the case of railroads which earn what they are allowed to earn as a matter of constitutional right, social justice or national interest. It can hardly be claimed that the profits earned or the dividends paid by the railroads are today in excess of what is desirable in the national interest. . . .

"Once it is conceded, as I think it must be, that the increased cost of replacement must be financed out of revenues, then the problem becomes a simple one. If the charge comes after deduction of taxes and the determination of net income, then the amount to be provided must be such that after taxes are paid thereon, the remainder will be sufficient to finance the additional capital costs. If the charge were allowed as a deduction before taxes in determining net income, then the amount required would be less by the amount of the taxes saved."

Mr. May's own view is that the LIFO-basis charges "should be brought into account before arriving at the amount of income from operations, preferably under the general caption of operating expenses." He suggested also that the corresponding credit "should be to a specifically designated reserve account (assuming that the use of the word 'reserve' in the general sense in which it is now used by the commission is to be continued)." In closing Mr. May pointed out that there is nothing "revolutionary or novel" in the suggestion that charges for exhaustion of railroad property should be placed on the basis of current replacement.

"The method," he said, "is that which was employed when I first became interested in railroad accounting

more than 50 years ago. The method is now employed in respect of track. Adoption of the proposal would make the treatment of replacements homogeneous for all classes of property. It is the urgency and magnitude of the problem that are new. . . . What profits railroads shall be allowed to earn is an economic question of great importance but it is an issue on which interests conflict and it is not a question for accountants. But what must be provided before there can be said to be any profits is another question that has great economic importance, does not involve a conflict of interests, and one of the most important topics that affect railroad accounting today."

To illustrate the effect of the plan he was advocating, Mr. May calculated that, if it had been applied to the 1947 accounts, it would have made that year's replacement costs \$175 million more than the depreciation charges based on original cost. If the additional \$175 million were allowed as a deduction before taxes, as Mr. Mal also advocates, the net reduction in the 1947 net railway operating income would have been about \$1000.

A.A.R. Vice-President Bunnell's progress report on the work of the division's special committee on research said that the term "research" as applied to such work was "intended to denote the continuous and never-ending quest for improved plans, methods and procedures made possible by the utilization or adaptation of mechanical devices and aids in the performance of all railroad accounting and statistical 'paper' work." He explained further that the special committee's approach is "factual and realistic" rather than "theoretical or scientific," and that it "does not deal with accounting principles."

The special committee has held four meetings, and has appointed a subcommittee for contact with manufacturers of office equipment and other mechanical devices. It has also docketed for study several subjects of which Mr. Bunnell listed the following: Train Consists, Car Accounting and Related Matters; Budgeting and Accounting Controls; Waybilling and Revising (Including Tariffs and Division Publications) and Overcharge Freight Claims; Ticket Selling and Related Station Accounting; Traffic and Commodity Statistics; Operating Reports and Statistics for Managerial Purposes; Passenger Auditing; Disbursements, Including Investment Accounting and Depreciation Records; Timekeeping, Payrolls, Payroll Distribution and Related Records; Bills and Vouchers—Preparation and Recording, and Loss and Damage Freight Claims; Accounting Organization Procedures and Training Personnel; Income and Payroll Taxes; Reproduction Methods and Devices; and Duties and Procedures of Stationery, Forms and Records Committees.

Chairman Tobin's Address

Chairman Tobin's review of division activities during his administration noted that the several standing committees considered and submitted recommendations covering 214 subjects formally docketed for their consideration. He explained that approximately 275 submissions or proposals were encompassed within the 214 subjects and that 108 of them were approved or accepted. The net result was 64 changes in the mandatory and recommendatory accounting rules and 15

changes in the standard forms—some involving new rules or forms and others amending the previous rules or forms.

"Viewing in retrospect the progress that has been made during the past year despite the many problems besetting our industry, we can find much that is encouraging," Mr. Tobin went on. "A greater tonnage of freight has been moved a greater number of miles than ever before in time of peace. There are evidences of an awakening public consciousness of the vital need of an adequate rate structure in the railroad industry to keep pace with the rising costs and of the lessening of restrictive legislation with which the carriers have been sorely burdened throughout the years.

"A.A.R. President Faricy has stated that one of the major problems is to restore the balance between income and outgo. In the all-out drive to meet this problem, management will look to the accounting officers to intensify their continuous and concentrated efforts to reduce costs by simplifying and standardizing applicable procedures, the development of new methods and procedures, and the improvement of those in current use. Reduction in the volume of so-called 'paper work' should be the prime objective of the Accounting Division's committees, in collaboration with the vice-president (Mr. Bunnell) and his staff."

A 398-Page Agenda

Reports of the various standing committees were briefed at the meeting by the committee chairmen. These reports are printed in full in the agenda (a document of 398 pages) which had been distributed before the meeting. Thus the detailed committee action is not reported here. All committee reports were received by the convention without debate, and but few modifications of the agenda's texts were announced by the reporting committee chairmen.

In making the report of the general committee, Secretary Ford called attention to a June 23 letter which Mr. Bunnell received from Dr. Ford K. Edwards, director of the I. C. C.'s Bureau of Accounts and Cost Finding, regarding the proposed accounting order modifying the form, and instructions relating thereto, of consolidated statistical statements. Dr. Edwards advised that the bureau was permanently removing the subject from the list of those it has submitted to the division for consideration, because it has now concluded that "it is undesirable to include any requirement for consolidated statistical statements in the uniform system of accounts." At the same time he also advised that neither his bureau nor the Bureau of Transport Economics and Statistics "is willing to recommend the further waiving of the commission's order of December 18, 1941, as modified on August 31, 1942, requiring consolidated statistical statements, which has been deferred successively each year since 1942." In that connection Dr. Edwards went on to say that the order and its amendments "will be appropriately modified to conform with the currently effective accounting classifications," and that any suggestions for modifications should be transmitted to the Bureau of Transport Economics and Statistics "as early as possible."

First of the addresses which were tied in with committee reports was that of K. H. Lyrle, auditor of

disbursements, I. C., and a member of the committee on statistics, who spoke on "Recent Developments in Cost Finding for Railway Freight Service." The address, as Mr. Lyrle described it, was an undertaking to bring the accounting officers up to date on the recent procedures in the cost field as found in the exhibits and testimony recently presented by the I. C. C. staff in Docket No. 29555, Pick-Up and Delivery Service by Railroads, and Docket No. 29556, Charges on Small Shipments by Railroads. He pointed out that the railroads have not yet had sufficient time to analyze these voluminous exhibits for the purpose of determining the soundness and accuracy of their showings; such a program, now under way, will require "several months" for completion.

Competent Cost Staffs Needed

While he expressed his opposition to "any cost formula or cost procedures which would require a current routine reporting of accounting or statistical information," Mr. Lyrle nevertheless stated it to be his belief that "it would be a most opportune move on the part of the railroad industry to now recognize the need for competent trained personnel in the field of cost finding." He pointed out that railroads have thus far been reluctant to maintain adequate staffs of trained specialists who would be capable of analyzing the cost formula mentioned above.

Papers were presented by two members of the committee on freight accounts—W. F. Gerrow, auditor of freight traffic, Pennsylvania, and L. B. Pond, assistant comptroller, New York, New Haven & Hartford. The former reported on recent developments in the way of reducing the cost of the determination and application of divisions, while Mr. Pond suggested several ways in which presently available business machines may be installed to advantage for the performance of freight-accounting work.

Here also, W. J. Kelly, traffic officer of the A.A.R., spoke briefly on tariff simplification. Mr. Kelly conceded that tariffs have grown more complex in recent years, but he foresaw an early halt of that trend and then some progress toward simplification. He mentioned the progress being made toward the development of a uniform classification, and also referred to the I.C.C.'s plan to establish a uniform class-rate scale for application east of the Rocky mountains. Meanwhile, Mr. Kelly anticipates more immediate relief when the commission makes its ultimate decision in the Ex Parte 166 freight-rate case. That will permit retirement of the master tariffs which were used to publish the interim increases, he pointed out.

Southern Likes Ticket Machines

Supplementing the report of the committee on passenger accounts was an address on "Ticket Selling and Related Station Accounting," by J. H. Scott, auditor of passenger accounts, Southern. This was a discussion of the development of the ticket accounting machine on that road, where it is now used by 69 agencies. The Southern has found that the machines reduce ticket-agency labor costs without increasing audit office labor costs; and that they provide for better protection of revenues.

The report of the committee on disbursement accounts was supplemented by a paper on "Accounting Aids to Management," which was presented by C. W. Powell, auditor of disbursements, Seaboard Air Line. He gave various specific examples of how the accounting department can point up situations and practices requiring correction in the interest of operating economies. It was Mr. Powell's view that an alert accountant should turn up many such situations as he observes various operations along the line.

I.C.C. staff members who made brief informal addresses included Director Edwards of the Bureau of Accounts and Cost Finding, and Dr. W. H. S. Stevens and G. S. Douglass, directors, respectively, of the Bureau of Transport Economics and Statistics and Bureau of Valuation. Dr. Stevens said the commission does not get many suggestions from the railroads on the matter of improving its statistics. Most of the suggestions, he added, have come from the commission's staff; and he does not think that should be the situation.

Later on, Chairman-Elect Connolly expressed agreement with Dr. Stevens, saying that it was up to the accounting officers to initiate matter with the commission. Mr. Connolly also said he hoped that during his administration the division would make further progress toward making the industry recognize what an accounting officer can do for his company, i.e., toward showing "that an accounting officer is the right hand of management and not just a damned book-keeper."

Meanwhile other brief addresses had been delivered by Chairman W. J. Kennedy of the Railroad Retirement Board and F. C. Squire, its railroad member; Dennis A. O'Brien, deputy second assistant postmaster general; and Robert S. Henry, A.A.R. vice-president in charge of the Public Relations Department. Mr. Squire described the recent amendments to the Railroad Retirement and Railroad Unemployment Insurance Acts which increase Retirement-Act benefits by 20 per cent and restore that act's lump-sum death-benefit provisions; and place the unemployment-insurance tax on a sliding-scale basis which has cut that levy (paid entirely by the railroads) from 3 per cent to 1/2 per cent of taxable payroll.

Colonel Henry told how the railroads have learned that they must not only do a good job, but must also let the public know that they are doing it. The industry, he added, is now giving the public the facts about railroading; and it is thus under "great obligation" to accounting officers who supply those facts.

Nineteen manufacturers participated in the exhibit which was set up in rooms adjacent to the convention's meeting hall. The exhibitors were:

Addressograph-Multigraph Corporation
H. K. Baumgardner Sales & Service
Brooks Company
Burroughs Adding Machine Company
Clary Multiplier Corporation
A. B. Dick Company
Dictaphone Corporation
Thomas A. Edison, Inc.
Felt & Tarrant Manufacturing Co.
Friden Calculating Machine Company
General Register Corporation
International Business Machines Corporation
Munroe Calculating Machine Company
Moore Business Forms, Inc.
National Cash Register Company
Recordak Corporation
Remington-Rand, Inc.
Sorter-Graf Company
Standard Register Company

MECHANICAL MEETING

(Continued from page 84)

"To such undergraduate scholarships might well be added a few graduate fellowships. It would be interesting to know how many engineers or scientists with advanced degrees are employed by the railroads. I am inclined to think the number is very small.

Encourage Present Employees

"Finally, the railroads should encourage their present employees to attain greater scientific knowledge and technological skill, either informally, or through evening courses in metropolitan centers. At present, many firms conduct schools of their own for their employees; still others have well developed working arrangements with colleges and universities.

"Whatever the method or methods used, I think that the results of such a program will be apparent soon. A haphazard program of recruitment, research, and development seems certainly a great risk. And beyond the immediate future, beyond the short-run need, the railroads owe it to themselves to support research and education. Without this help from industry, it may be necessary that the government take over more and more of this support. In this, I believe, there is involved an even greater risk."

REPORT OF GENERAL COMMITTEE

Activities of the past year are reviewed with emphasis on research work of the Division

Application of AB brakes. As of December 31, 1947, 1,427,566 railroad-owned and 147,375 private car line cars, or a total of 1,574,941 interchange freight cars, or 73.6 per cent were equipped with AB brakes meeting the requirements of the specifications for freight brakes adopted in 1933. This was an increase of 165,639 cars equipped with AB brakes since December 31, 1946. Report covering the status of application of these brakes as of June 30, 1948, will be submitted as soon thereafter as the information can be compiled.

The final order of the Interstate Commerce Commission issued September 21, 1945, requires the installation of these brakes on all cars in freight service except those equipped with passenger car brakes, in accordance with the terms of its report May 30, 1945, on or before January 1, 1949. It is quite evident that in view of the present material situation, this goal cannot be attained. A number of railroads and private car lines are filing petitions with the I.C.C. for an extension of time within which to comply with the Commission's Order.

Car Designs — Refrigerator Cars. The Refrigerator Car Research Bureau, which was organized in March, 1946, has carried on an intensive program of tests in cooperation with the United States Department of Agriculture and the shippers of various commodities to determine the efficiency and adequacy of the present designs of refrigerator cars from the standpoint of insulation thickness, general characteristics and the use of forced air circulation.

Reports on many of these tests have been completed and submitted to the members and others interested. Very shortly there will be issued reports on a number of other tests, including heat and water-vapor transmission studies, which contain much valuable information to the car lines and railroad.

During this year the refrigerator car research program includes a number of tests, as follows:

- 1.—A test on peaches from South Carolina or Georgia to New York, comparing forced air circulation in cars with other cars having no forced air circulation.
- 2.—A hot-weather test on frozen foods from Modesto, Cal. east, using one car with 4 in. of insulation all around, one with 4-4½ in. of insulation, and one with 6-7 in. of insulation, all three cars to move with forced air circulation and to have reflective material applied to the insulation.
- 3.—A short-haul frozen-foods test from Houlton Me., to Newark N. J., using cars equipped with air circulation.

Coordinated Mechanical Associations. Last year the Air Brake Association was revived and made a member of the Coordinated Railroad Associations because of the present day importance of air brakes and air-brake instruction. It is the feeling of the General Committee that the re-establishment of the Air Brake Association and the discussions and reports from its committees and members will be of great value to the railroads.

Arrangement has also been made that in the future the Electrical Section of the Mechanical Division of the A. A. R. will be a part of the coordinated group of railroad associations so as to provide opportunity for the members attending the other meetings to also hear and take part in discussion of interest to them in connection with the maintenance of electrical equipment of Diesel locomotives, air conditioning, high-speed air brake equipment, etc. In future years the electrical equipment manufacturers will exhibit at the coordinated conventions on alternate years with the Allied Railway Supply Association.

At a recent meeting of the Executive Committee of the Coordinated Associations, J. E. Goodwin was elected chairman and J. M. Nicholson was elected vice-chairman.

It is recommended that the mechanical departments of member roads support these associations by allowing their supervisory officers to accept appointments to membership on committees and to attend the annual conventions.

Loading of Lumber. The recommendations of the Special Committee on Lumber Loading agreed to by the shippers were placed in effect January 1, 1948. Reports to date indicate that these revised rules had been quite effective in improving the handling of this product to destination with a greatly reduced amount of trouble, adjustments or transfers en route.

The General Committee appreciates very much the work of this Special Committee on Lumber Loading and the splendid cooperation received from the shippers of this product.

Trucks for High-Speed Freight Service. Since the tests conducted by the A. A. R. Mechanical Division during 1938 and 1939, considerable development has been made in the design of freight trucks, including the appli-

cation of snubbing devices, to prevent damage to lading from vertical and lateral shocks.

For the purpose of comparing and evaluating the snubber and freight-truck designs now available, negotiations with the manufacturers of these devices by the A. A. R. Mechanical Research Office during the past several months has resulted in the development of a cooperative research program. This program contemplates the use of the American Steel Foundries Service Laboratory equipment (five-car unit) and their trained technicians, under the general direction of the Mechanical Research Office. It is proposed to carry out a field testing program during 1948, at an estimated cost of \$65,000 to the railroads, and approximately \$160,000 to the equipment manufacturers. The plan agreed to by the manufacturers and the research office, collaborating with the Committee on Car Construction, contemplates a series of road tests to be carried out on the Illinois Central out of Clinton, Ill. The program also contemplates a laboratory test program to evaluate the relative service-life of the devices qualifying as acceptable during the road test program. Corollary to the main objectives of the proposed research project are included the evaluation of long-travel truck springs compared to the present conventional design, comparison of the spring with the spring-plankless design of freight truck, and the effect of removal of the end collars of axles on the lateral movement of cars in transit. Comparison of the conventional solid type bearing with roller bearing for freight service is also to be included in the program.

This field testing program to be completed during the year 1948, has been approved by the board of directors of the association and will be started July 1, 1948.

Air Conditioning of Railroad Cars. The American Society of Heating and Ventilating Engineers has a research organization to carry on basic research relating to heating, ventilating, and air conditioning. On invitation from that society to the A. A. R. Mechanical Division to participate in the activities relating to air conditioning which would be applicable to railway equipment, a joint committee was appointed during 1947 to study the ASH&VE laboratory facilities in Cleveland, Ohio. As a result the committee recommended participation by the A. A. R. in four projects, as follows: (a), standardized test procedure for air filters; (b), studies dealing with solar-heat load in cooling and heating, and periodic heat flow through structural materials; (c), studies on the physiological adjustment of human beings to sudden changes in atmospheric environment; (d), studies dealing with the distribution of heated and cooled air and air friction.

The A. A. R. has approved the sum of \$4,000 as its portion of the expense of this project for 1948. It is contemplated that completion of the four studies will require from three to four years at an annual expense to the A. A. R. of approximately \$4,000 per year. This is an example of participation in organized research, the actual work of which will be progressed in existing laboratory facilities by trained personnel available for that class of research. A. A. R. participation will consist of representation on the steering committees responsible for each of the four research projects. These representatives will be looked to to give direction to the activities from the railroad viewpoint. The techni-

cal information developed as the work progresses will be made available to the Mechanical Division.

During the past year the field tests on two projects have been completed and reports are in preparation. These investigations covered the Impact Effect of Flat Wheels, conducted on the Chicago & North Western at Harvard, Ill., and the Intensity of Lateral Forces from Locomotives with Respect to Track Alinement, conducted on the Santa Fe rails at Cajon Pass, Cal.

Consideration is being given to the provision of enlarged office and limited new laboratory facilities to take care of the increased work of the Research Office.

In view of the prospective conditions with respect to hotel facilities for meetings during the year 1949, arrangements have already been made to hold the 1949 Annual Meeting of the Division at the Congress Hotel, Chicago, on Monday, Tuesday and Wednesday, June 27, 28 and 29, 1949.

Life Members.—The following have been made Life Members of the Division, since June, 1947:

Date Joined	Name	Title and Railroad
1928—	Becherer, F. H.,	superintendent car department, (retired) Baltimore & Ohio.
1928—	Bjorkholm, J. E.,	superintendent motive power, Chicago, Milwaukee, St. Paul & Pacific.
1928—	Bowen, H. B.,	chief motive power and rolling stock, Canadian Pacific.
1928—	Elsey, W. R.,	assistant vice-president, Purchases, Stores and Insurance, Pennsylvania.
1928—	Gimpel, F. H.,	mechanical superintendent, Manufacturers Railway Company-St. Louis & O'Fallon.
1928—	House, C. M.,	general superintendent motive power and equipment, Gulf, Mobile & Ohio.
1928—	Lynch, G. G.,	assistant to chief motive power and equipment, Atlantic Coast Line.
1928—	Miller, A. T.,	superintendent motive power, Georgia Western of Alabama.
1928—	Rees, H.,	superintendent motive power, Baltimore & Ohio.
1928—	Silfies, D. M.,	superintendent transportation, Buffalo Creek & Gauley.
1928—	Spangler, P. F.,	assistant superintendent motive power St. Louis-San Francisco.
1928—	Steins, C. K.,	mechanical engineer, Pennsylvania.
1928—	Wilber, R. W.,	superintendent motive power and equipment, Detroit, Toledo & Ironton.
1928—	Williams, H. W.,	division master mechanic, Chicago, Milwaukee, St. Paul & Pacific.

Obituaries.—The secretary has been advised of the death of the following members since June, 1947:

Name	Title and Railroad	Died
Argast, H. C.,	(Life), superintendent car department, St. Louis & O'Fallon-Manufacturers Railway	July 9, 1947
Barthelemy, P. P.,	(Life), St. Paul, Minnesota.	July 29, 1947
Brown, F. W.,	vice-president, Charleston & Western Carolina	March 14, 1947
Fisher, T. W.,	assistant engineer of tests, Pennsylvania	September 5, 1947
Flowers, A. J.,	master mechanic, Central of Georgia	January 13, 1948
Harding, E. N.,	(Life), Lawton, Mich.	August 5, 1947
Harris, A. A.,	(Affiliated), mechanical supervisor, New York, New Haven & Hartford	April 7, 1948
Helbig, O. H.,	(Life), North Prescott, Ark.	December 17, 1946
Hunt, Robt.,	(Life), Berkley Machine Works & Foundry Co.	November 26, 1947
Huston, F. P.,	(Affiliated), in charge railroad developments International Nickel Company	December 29, 1947
Imgrund, G. W.,	(Life), vice-president, Chicago & Illinois Midland	April 5, 1948
Laughlin, G. F.,	(Affiliated), Chicago	August 29, 1947
McGoff, H. M.,	(Affiliated), Fort Madison, Iowa	July 4, 1947
Needham, H. L.,	(Life), Chicago	April 16, 1947
Propst, C. F.,	(Life), Attica, Indiana	July 31, 1947
Sanchez, Jose,	Master Mechanic Vera Cruz Terminal Company	October 6, 1947
Schultze, R. W.,	(Life), Santa Ana, Cal.	March 3, 1947
Whitford, W. S.,	(Life), 915 Fifth street, Boone, Iowa	
Willey, Dean F.,	vice-president-operating, maintenance & engineering, New York, New Haven & Hartford	January 23, 1948
Willhide, G. O.,	general master mechanic, Western Maryland	August 25, 1947

The report was signed by, J. M. Nicholson (chairman), assistant to vice-president, A. T. & S. Fe.; A. K. Galloway (vice-chairman) general superintendent motive power and

equipment, B. & O.; C. B. Hitch, chief mechanical officer, C. O.; F. K. Mitchell, general superintendent motive power and rolling stock, N. Y. C.; H. T. Cover, chief motive power, Penna.; M. R. Brockman, assistant vice-president, Southern; R. G. Henley, general superintendent motive power, N. & W.; A. G. Kann, general superintendent equipment, I. C.; H. B. Bowen, chief motive power and rolling stock, C. P.; J. E. Goodwin, chief mechanical officer, C. & N. W.; B. M. Brown, general superintendent motive power, Sou. Pac.; John Gogerty, general superintendent motive power and machinery, U. P.

PURCHASES AND STORES

(Continued from page 115)

tal average monthly disbursement of material and supplies of \$180,740,664, an annual outlay of \$2,168,887,978. While all of this was not handled at storehouses, inasmuch as rail, ties and some other items move direct from mill to point of use to avoid rehandling costs and to facilitate the work, the larger portion of this huge expenditure for material actually required rehandling at storehouses and shops to make it available when and where needed. The magnitude of the job we have to do as supervisors of handling this great volume of material is quickly recognized. If we can, by improving our methods, cut even a fraction of a percentage point from our handling cost, we have brought about a decided reduction in our expenditures, which will reflect favorably in the balance sheet of our railroads.

"We supplement our handling cost per \$1,000 of material by other checks, which are based on handling a ton of such items as iron and steel bars, shapes, billets, plates and sheets, pig iron, brake shoes, rail fastenings, cement, soda ash, castings, forgings, fence wire, nails, rivets, bolts and other items received in car lots, and weight is obtained from freight bills or tracks scales. These checks afford us definite figures on the cost of handling, and make a yardstick which eliminates the factor of changes in values, which has to be reckoned with in the cost per \$1,000 for material handled.

"We also make time studies on a man-hour basis for handling material, and that unit is a constant one, as a man-hour in 1948 is exactly the same as a man-hour in 1947 or any other period. I recommend to you in your search for a yardstick to measure the efficiency of your operations, the use of the cost per ton and man-hours involved in handling materials of a heavy or bulky nature.

"Your committee on Subject 15, which has just presented a splendid report to you at this meeting, is a 'must' committee of this division. It just has to be continued each year to bring to our attention improved methods and ways of handling material, as the changes in design and use are rapid, and we must go forward constantly in our search for better methods of doing our work and reducing our cost to overcome the constant increase in everything we buy and use.

"The railroads, to survive as private enterprises in the face of so many mounting increases in their expenditures for wages and material and supplies, taxes,

etc., must reduce their costs to keep pace with the rapid increases being made in all of these items. They can do so only by improved methods, and you and I, as members of the railroad group in charge of large expenditures, must use our experience, our ingenuity, our talents and our energy to do the most for the least.

"Bear in mind that every time a piece of material has to be rehandled its cost is being increased. Reduce the rehandling by endeavoring to make your first picking-up and putting-down of material the last; make your storage as close to the place of largest use as you possibly can. Do not move material 2,500 feet to get it used, but put it close to using point. There is no greater factor in the handling of material than the distance you have to move it to get it to place of use.

"You can improve your handling methods by getting concrete pavements through your material yards for using crane trucks, fork trucks, lift trucks, and tractors and auto trucks, as you must have pavements to successfully operate these important units all during the year.

"We recently made some comparisons at our district and general stores on man-hours worked before the war and after the war, giving due consideration to additional work performed, and the result indicated our investments in concrete roads and material handling equipment were paying dividends.

"Management can be convinced that these things are essential and profitable to keep your material handling costs down and to perform your work efficiently. Material handling is one of the most important, if not most important, assignment that we P. & S. men have."

"COMPARATIVE ANALYSIS OF MATERIAL BALANCES, 1940 AND 1948"

Discussing the material stock report originated in 1927, J. S. Fair, Jr., purchasing agent of the Pennsylvania, referred to it as a very practical attempt to give stores and purchasing officers a yardstick for the comparative measurement of disbursements and inventory. It has been helpful, he said.

"In 1939 average monthly disbursements for 76 of the Class I railroads amounted to \$50.2 million, while in 1947 the figure was \$114.9 million, an increase of 129 per cent. Meanwhile, however, average prices had risen approximately 73 percent, and if this is taken into account, the average consumption of fuel, materials and supplies in 1947 was \$66.4 million per month at 1939 prices, an increase of 31.7 per cent. In other words, it can be said that in 1947 these railroads used 31.7 per cent more in quantity of material than they did in 1939.

"A good measure of work done by a railroad is gross ton-miles. In 1947 gross ton-miles amounted to 1,368 billion for the 76 railroads, and this was 52.8 per cent greater than the output for 1939, when it was 896 billion gross ton-miles.

"The direct relation between materials consumed

and work performed is expressed by the value of disbursements per billion gross ton-miles. In 1939 about \$672,000 worth of materials were consumed per billion gross ton-miles. In 1947 the actual figures was approximately \$1,008,000, but the disbursements in that year on the basis of 1939 prices were \$583,000. Hence the quantities of materials consumed in 1947 were about 13.4 per cent less than in 1939 for an equivalent amount of work performed.

"The reasons for the lower consumption per unit of work are: (1) more efficient use of materials; (2) improvement in basic materials and better design of equipment; and (3) planning and control by the purchasing and stores departments.

"On December 31, 1939, the inventory of the 76 railroads amounted to \$185.9 million while on December 31, 1947, the figure was \$464.9 million, an increase of 150 per cent. The inventory on December 31, 1947, adjusted to 1939 price levels, was \$274.9 million, an increase of 48 per cent over the corresponding period of 1939.

"By relating the inventories for the two years to the volume of work performed, as was done with disbursements, it is found that at the end of 1939 these railroads had in stock materials valued at \$208,000 per billion gross ton-miles, and at the end of 1947 the inventory per billion gross ton-miles was about \$201,000 at 1939 prices.

"The outstanding point in connection with this obvious control of investment in stock, with its saving in carrying charges, is that lead time for delivery of materials in 1947 was generally twice as long as in 1939 and therefore inventory in 1947 might very easily have been much larger, and stocks of certain materials much farther out of balance than this analysis indicates.

"We have developed that, on the basis of work performed, the consumption of materials in 1947 was 13.4 per cent lower than in 1939, and inventory at the end of 1947 was 3.2 per cent less than in 1939. The greater reduction in consumption than in inventory is verified by the material stock reports' figures on days' supply on hand at the close of the two years. The 76 railroads reported 121 days' supply on hand December 31, 1947, and this was 10 days, or 9 per cent more than in 1939. Thus we have an indication of inventory being slightly out of balance with the current rate of consumption.

"In order to get a closer measure of what might be happening to railroad consumption and purchasing, purchases and inventory by A. A. R. material accounts were consolidated by five representative railroads for the years 1939-1947. Several interesting points are brought out by this comparison, which was made on the basis of 1939 prices throughout. This means that in this particular part of the analysis, we are talking only about the relative number of pieces bought and in inventory in the two years.

"The purchases of the five railroads in 1947 were 58.7 per cent greater in quantity than in 1939, and this compares very closely with a 57.5 per cent increase in the gross ton-miles of all railroads in 1947 over 1939. It is believed, therefore, that generally speaking the trend of buying of these five railroads is fairly characteristic. To be on the safe side, however, we have selected for discussion only eight classes of material which show a marked difference in 1947 as compared with 1939."

GENERAL NEWS

Rail Labor Injunction Is Made Permanent

Goldsborough would have issued it without government control or roads

Declaring that his ruling would have been the same, even if the government had not taken over control of the railroads, Justice T. Alan Goldsborough of the United States District Court for the District of Columbia has granted a permanent injunction restraining the three holdout operating unions and their leaders from staging a strike. Meanwhile, Dr. John R. Steelman, assistant to President Truman, on July 7 resumed his efforts to mediate the wages and rules dispute involving the three brotherhoods whose May 11 strike threat brought government control of the carriers under Secretary of the Army Royall.

While no announcement as to the progress of the negotiations had been made there were indications when this issue went to press that they might be entering the decision stage. The parties met in joint conference with Dr. Steelman from 9 p.m. July 7 until 1 a.m. July 8 and were scheduled to return to the White House at 3 p.m. on the latter day. President Truman appeared determined to obtain an agreement.

The unions involved are the Brotherhood of Locomotive Engineers, headed by Grand Chief Engineer Alvanley Johnston; Brotherhood of Locomotive Firemen & Enginemen of which D. B. Robertson is president; and Switchmen's Union of North America of which A. J. Glover is president. The permanent injunction, sought by the federal government, was granted by Justice Goldsborough on July 1, following a hearing the same day. It replaces a preliminary injunction which had been in effect since June 10, that injunction, in turn, having replaced a temporary restraining order granted May 10, several hours before the scheduled walkout. The unions are expected to appeal from Justice Goldsborough's latest ruling; their appeal from his order issuing the preliminary injunction is pending before the Circuit Court of Appeals for the District of Columbia.

Public Interest Paramount

Justice Goldsborough's suggestion that government seizure of the railroads was not required was based on his opinion that the injunction should have been issued even if the government had simply brought action for it

against the brotherhoods. In this respect, he said it was his view that the Norris-LaGuardia Act, which prohibits injunctions in labor disputes, should not be "literally" construed to permit unions "however much right they have on their side," to go to the point "of adopting a process which will disintegrate society itself, and that is the situation here."

Justice Goldsborough then referred to the strike notice of April 29, which, he said, advised members of the three unions that they had as much "legal right" to refuse to perform service on mail trains as they had to refuse to perform service on any other train. The strike notice, he added, also advised that "men in road and yard service are to handle and transport troop trains, hospital trains and milk trains with the understanding that no other service is to be performed in connection therewith." The unions, he said, sent out that notice to their members despite the fact that they had the "benefit" of three impartial bodies which attempted to bring about a settlement.

"An Extreme Case"

"The undisputed evidence that the mail cannot be handled and the undisputed evidence that from 70 to 72 per cent of the freight traffic could not be handled means that in a few weeks hunger would stalk the country, the whole economic and political ideologies which are opposed to the democratic system would have an opportunity to engraft themselves here in this country and our influence through the world would be done away and become a laughing stock," he said. "It is an extreme case, and it constitutes, in this court's opinion, a limitation upon the power of a labor union to carry out its purposes, however legitimate they may be, by the strike process."

Conceding that the Norris-LaGuardia Act was designed to give labor a bargaining power comparable with that of employers, Justice Goldsborough nevertheless insisted that "to permit a strike of this kind to take place is an extreme situation which society is not required to tolerate." He added that he also wanted "to emphasize the court's deliberate opinion that the Norris-LaGuardia Act does not control a situation where the entire transportation system of the country would be stopped."

Before getting into his discussion of the injunction phase, Justice Goldsborough had disposed of the venue issue, rejecting the brotherhoods' contention that the suit was not properly brought in the District of Columbia.

Among other reasons for this determination, the court pointed out that the B. of L.E. maintains an office in Washington and that President Robertson of the B. of L.F.&E. and President Glover of the Switchmen's Union are members of the Railway Labor Executives Association, which maintains its headquarters in Washington.

Unions' Contentions

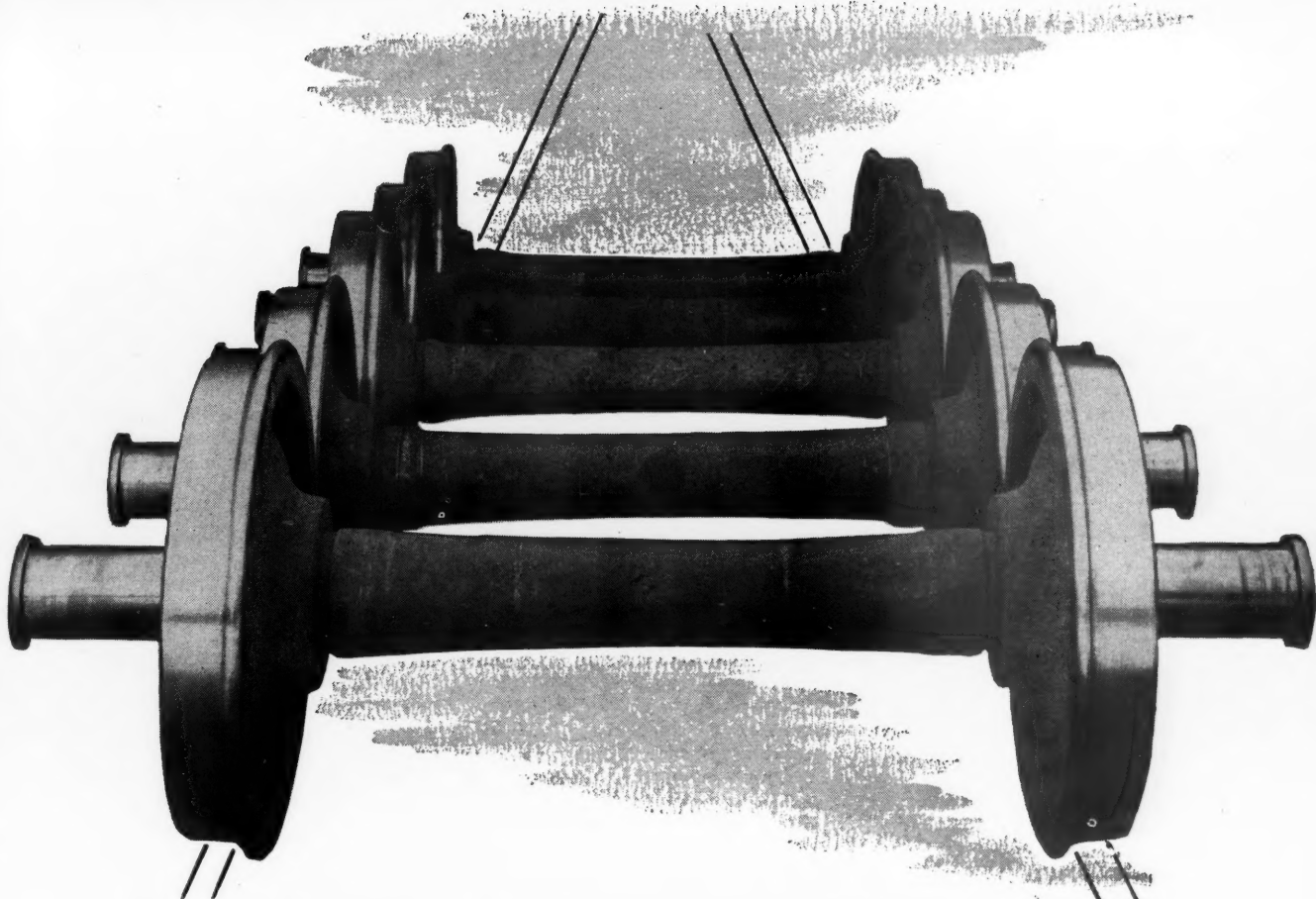
In arguing for the applicability of the Norris-LaGuardia Act, the unions had asserted that the government "has not assumed the duties of an employer" with respect to railroad employees. Thus they contended that the case was not comparable to the 1947 proceeding involving the injunction Justice Goldsborough granted against the United Mine Workers and its president, John L. Lewis, at a time when the mines were under government control and the miners were working under an agreement negotiated with the secretary of the interior. This contention was supported by statements to the effect that Secretary Royall had told the union leaders at conferences on May 10 and 11 that he was without authority to deal with the wage and rules dispute.

Justice Goldsborough said in his opinion that he could see no difference between the present case and the United Mine Workers case; and thus the Supreme Court's decision upholding his ruling in the latter was "controlling." He went on to say that it is more a matter of law than a matter of the understanding of different individuals as to what was said between the heads of the three unions and
(Continued on page 162)

Drop in Car Output Laid to Steel Supply

Year-old program of O. D. T. reviewed by Colonel Johnson

Temporary loss of steel production as the result of inclement weather and coal strikes, failure of the car builders and component-parts manufacturers to absorb an average of 6,800 tons of steel per month that has been pledged by so-called premium-price mills and the failure of various steel producers to accept monthly assignments totalling about 6,900 tons are assigned by Colonel J. Monroe Johnson, director of the Office of Defense Transportation,



Turned with single tools *without grinding* BY THE NEW PROFILING METHOD

THESE car wheel sets were turned by the new profiling method on a Niles 52" Car Wheel Lathe. Finish of the tread closely approaches that obtained by grinding, and in the opinion of railroad officials who have witnessed this operation, subsequent grinding operations are not necessary. Extreme accuracy is obtained. Use of only a single tool and elimination of grinding makes possible remarkable savings in time.

Both Niles Car Wheel and Niles Driving Wheel Lathes are now being built with the tread profiling attachment. This is an entirely hydraulic device which produces a profile on the wheel or tire tread that is an exact duplicate of the template used. Suitable speeds are provided for the use of carbide tools. The pneumatically operated self-equalizing driver dogs ensure accuracy of concentricity, and a special calipering device assists the operator in turning both wheels to exactly equal diameters.

We would like you to see a lathe with this profiling attachment in operation. For arrangements write R. S. Henninger, Lima-Hamilton Corporation, 648 Niles Ave., Hamilton, Ohio.



DIVISIONS: Hamilton, Ohio—Niles Tool Works Co.; Hooven, Owens, Rentschler Co. Lima, Ohio—Lima Locomotive Works Division; Lima Shovel and Crane Division.

PRODUCTS: Niles heavy machine tools; Hamilton diesel and steam engines; Hamilton heavy metal stamping presses; Hamilton-Kruse automatic can-making machinery; Locomotives; Cranes and shovels; Special heavy machinery; Heavy iron castings; Weldments.

as the primary reasons for the failure of the freight car building program to achieve its designated monthly output of 10,000 new cars. At the same time, however, he is of the opinion that the freight car construction and repair program has been "reasonably successful" within its "established limits."

Colonel Johnson's remarks were contained in a report, "A Year's Operation of the O.D.T. Freight Car Program," which he has sent to officers of all steel companies participating in the program. Among other things, the report analyzes the material presented and summarizes the conclusions reached at a meeting of the Steel Industry Task Group at Washington, D. C., on June 18.

According to Colonel Johnson, the "considerable loss" in steel tonnage since January 1 will result in a "drastic curtailment" of the production of new freight cars and the repair of bad order equipment starting July 1. It is estimated, he said, that the total slippage below the 10,000 car objective will run from 2,000 to 2,500 cars monthly, with a "proportionate loss probable" in the repair program.

The O.D.T. director observed that the production of new cars from June, 1947, through May, 1948, totaled 97,255, as compared with an objective of 110,000, and that the output of new cars has remained in the neighborhood of 9,000 cars a month since December, 1947, when, he said, the peak figure of 9,823 cars was reached. "On this basis," he continued, "the program rates 88 per cent effectiveness and in view of the completely voluntary nature of the activity in all phases we believe it has been reasonably successful within its established limits."

Colonel Johnson said that, since its inception, the program has contemplated direct negotiation between the steel suppliers and steel consumers on the actual allotments of steel made to individual contract builders, railroads and component manufacturers. He added, however, that in the absence of any means whereby full requirements of each claimant could be distributed between steel producers, there has been "inevitable lost motion and immobilization" of "considerable quantities" of steel for which the steel consumers were unable to find complementary items. "It should be stated," he went on, "that procedures suggested by the O.D.T. to effect such a distribution have not been acceptable to the steel industry as a whole. O.D.T.'s activities in attempting to provide spot assistance for the elimination of steel bottlenecks has been effective, though naturally limited in application. Nevertheless, as was to be expected in a commercial operation such as this, the imbalance of steel shipments is to a large extent self-corrective and a level of stability has been reached."

According to Colonel Johnson, it is now "discernible" that, from the beginning of 1948—one month after the procedure requiring certification of orders

for steel under the program was begun—steel shipments have had a direct reflection in the number of freight cars produced. "The failure to attain a production of 10,000 cars per month since the peak month of December," he went on, "must be ascribed to the fact that shipments of steel for the program have fallen short of requirements. Up to the end of 1947, shipments of steel as reported by the steel producers more than met their obligations under the program, though it should be noted that there has been a large area of controversy between steel producers and steel consumers as to actual shipments of steel for domestic freight cars during 1947. The adoption of the certification procedure . . . has eliminated these uncertainties to a large extent so that it is now possible to relate steel shipments to freight car production."

Since the beginning of 1948, Colonel Johnson stated, deficiencies in shipments as against tonnage pledged have been "quite large." In this respect, he said that tonnage pledged from January through March was 722,154 tons, as against actual shipments of 674,247 tons, adding that if the normal ratio 674,247 tons, adding that if the normal of steel for repair purposes is deducted from that deficit of approximately 48,000 tons, the balance of 32,000 tons would have been sufficient for production of 2,000 cars monthly in March, April and May.

"The actual deficit in freight car production as against the 10,000 per month objective in these months was 2,454 cars," he said. "In the same way, it is estimated that the loss in steel ship-

ments during April, May and June due to the coal strike will total approximately 88,000 tons. The proportion of new car steel included in this total would be sufficient for the production of 3,600 cars, the loss of which we fear may occur during July, August and September."

The steel industry group, Colonel Johnson declared, could give no assurance that any of the loss in tonnage would be overcome during the third quarter. "This, unfortunately, is in conformity with their acceptance of Voluntary Allocation Plan No. 1 in which it was stipulated that in the event of lost steel production such losses would be applied proportionately to the tonnages pledged for the freight car program, but is at variance with their previous understanding with O.D.T.," he said.

Colonel Johnson reported that, in recommending distribution of quarterly steel requirements for the car building program, the Steel Industry Task Group computes assignments for each steel mill supplying products suitable for the program. He added, however, that the tonnages, as assigned, are not always accepted in full by the steel mills concerned.

"For example," he went on, "out of the total assignments of about 250,000 tons for the third quarter of 1948, there was failure to accept 6,900 tons. This is a continuing deficit factor in steel supply for the program. In addition, it is important to note that the steel industry is making space available for program steel expects it to be taken up without regard to base price or freight



The task of laying some four miles of track in preparation for the Railroad Fair, July 20 to September 6, inclusive, was completed last month. To mark the end of the job, Paul E. Feucht, vice-president, Western Region, of the Pennsylvania, drove a gold-plated spike with a "silver" mallet. Watching (left to right) were G. Murray Campbell, vice-president and executive representative of the Baltimore & Ohio; Major Lenox R. Lohr, president of the fair; and J. L. McKee, vice-president and assistant to the president of the New York Central

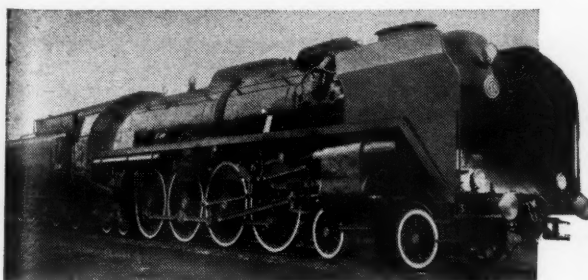
A REPORT FROM FRANCE . . .

on the Franklin Automatic Compensator and Snubber

In the December, 1947, issue of the *Revue Generale des Chemins de Fer*, M. Chapelon, the eminent French locomotive authority, describes the latest French 4-8-4 three-cylinder compound locomotive and makes the following statements:

“In addition to a frame built as rigid as possible all driving axles have been equipped with the Franklin Compensators and Snubbers. With this arrangement the wedges constantly take up the play which exists between the box and the pedestals, but due to the floating plate, any sticking of the box is avoided, and experience has shown that the box can thus freely move up and down without any play in the pedestals. Elimination of this play is absolutely necessary in an engine of this power to avoid harmful box pound which is experienced on the majority of single expansion 2 cylinder locomotives of the ordinary type as soon as full boiler pressure is used.”

“...the only solution which could overcome the box pound consisted in limiting the lost motion to a minimum. This solution was found in the use of the Franklin Compensators and Snubbers, which thus constitute one of the greatest improvements made during the last few years in the design of locomotives.”



Latest 4-8-4 French locomotive (Tractive Effort 65,400 lb) equipped with Compensator and Snubbers.

The French National Railroads made some initial applications of the Compensator and Snubber before the war. As a result of their experience with this device, it was applied to all of the 1340 French 2-8-2 locomotives built here after the war. That M. Chapelon has found them essential for his new locomotive indicates the importance that this prominent designer places on the elimination of pound — and the effectiveness of the Compensator and Snubber in accomplishing this. Many maintenance dollars can be saved by applying the Compensator and Snubber to your locomotives, whether equipped with surface bearings or roller bearings.



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STEAM DISTRIBUTION SYSTEM • BOOSTER • RADIAL BUFFER • COMPENSATOR AND SNUBBER • POWER REVERSE GEARS
AUTOMATIC FIRE DOORS • DRIVING BOX LUBRICATORS • STEAM GRATE SHAKERS • FLEXIBLE JOINTS • CAR CONNECTION

rate considerations. This so-called premium cost steel has not been absorbed in full volume of the consumers. In the months, January through May, 1948, the tonnages offered and not accepted are estimated to total about 34,000 tons, or an average of 6,800 tons per month. This is a circumstance over which the steel industry has little or no control, but the failure of steel consumers to take up this tonnage is bound to have its effect in depressing car production. There are other factors which have definite effects on the availability of steel such as the limited production of plates in large dimensions and the reduced production of axles."

Among other things, Colonel Johnson pointed out that the net gain in revenue freight car ownership by Class I roads between June 1, 1947, and April 30, 1948, totaled 8,284 cars. "This program," he said, "includes as one of its more important objectives expanded schedules for repairing existing freight equipment. The record of accomplishment here is similarly discouraging. Although in recent months heavy repairs of freight cars . . . have been in excess of 25,000 cars per month, there has been an increase in the number of cars awaiting repair. In the beginning of June, 1947, the percentage of cars on line awaiting repair stood at 4.6 per cent. The most recent report shows an increase to 5.1 per cent."

Colonel Johnson also said that the O.D.T. has been advised that it will be necessary to shut down a number of car building plants in the near future for two-to-three week periods because of steel shortages. "Since there is no sure prospect that the steel losses will be made up," he added, "it is feared that freight car production in future months will slip considerably below present figures, and if other disabling factors . . . continue we can see no helpful prospect beyond June of the attainment of the 10,000 car goal."

Evolution in Chilled Wheel Rims—a Correction

The illustration at the top of page 86 of the June 26 *Railway Age* on

which appears the article entitled "Evolution in Chilled Wheel Rims" were inadvertently transposed. These illustrations, properly placed, and the caption are repeated here.

5 Months Net Income Totaled \$165,000,000

Net railway operating income for the same period was \$285,928,720

Class I railroads in the first five months of 1948 had an estimated net income, after interest and rentals, of \$165,000,000, as compared with \$180,000,000 in the corresponding period of 1947, according to the Bureau of Railway Economics of the Association of American Railroads. The five-months' net railway operating income, before interest and rentals, was \$285,928,720, as compared with \$312,521,976.

Estimated results for May showed a net income of \$63,700,000, as compared with \$49,000,000 for May, 1947, while the net railway operating income for the 1948 month was \$90,178,066, as compared with \$76,818,499 in May, 1947. In the 12 months ended with May, the rate of return averaged 3.31 per cent for the 12 months ended with April, 1947.

Expenses Up Faster Than Revenues

Gross in the first five months amounted to \$3,768,613,307, compared with \$3,456,243,848 in the same period of 1947, an increase of nine per cent. Operating expenses amounted to \$3,022,827,278, compared with \$2,699,334,219, or an increase of twelve per cent. Thirty Class I railroads failed to earn interest and rentals in the five months, of which 14 were in the Eastern district, three in the Southern region and 13 in the Western district.

Class I roads in the Eastern district in the five months 1948 had as estimated net income of \$50,000,000, compared with a net income of \$66,000,000 in the same period of 1947. For May,

their estimated net income was \$29,000,000, compared with \$25,000,000 in May, 1947.

The same roads in the five months had a net railway operating income of \$109,701,676, compared with \$37,130,854 in May, 1947.

Gross in the Eastern district in the five months totaled \$1,726,359,476, an increase of 8.3 per cent compared with the same period of 1947, while operating expenses totaled \$1,415,638,348, an increase of 10.9 per cent.

Class I roads in the Southern region in the five months had an estimated net income of \$36,000,000, compared with a net income of \$30,000,000 in the same period of 1947. For May, they had an estimated net income of \$8,700,000, compared with \$5,000,000 in May, 1947.

The same roads in the five months had a net railway operating income of \$55,983,806, compared with \$49,549,541 in the same period of 1947. Their net railway operating income in May amounted to \$12,983,949, compared with \$9,832,956 in May, 1947.

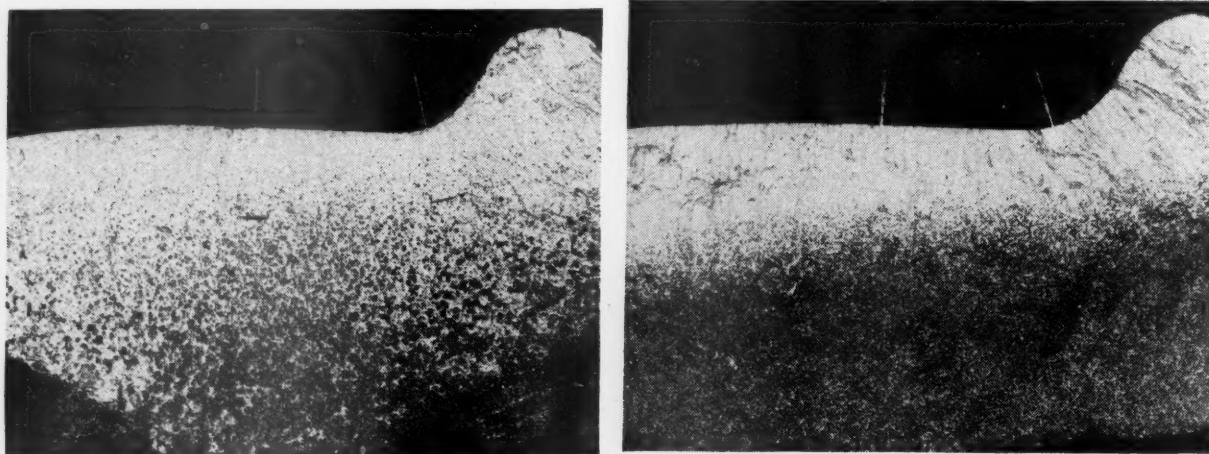
Gross in the Southern region in the five months totaled \$549,437,337, an increase of 8.9 per cent compared with the same period of 1947, while operating expenses totaled \$425,399,594, an increase of 8.7 per cent.

In the West

Class I roads in the Western district in the five months had an estimated net income of \$79,000,000, compared with \$84,000,000 in the same period of 1947. For May, they had an estimated net income of \$26,000,000, compared with (Continued on page 162)

New "Centuries" to Have Radio Phone Service New York-Buffalo

When the new equipment for the "Twentieth Century Limited" goes in service between New York and Chicago late in the summer, upon its delivery to the New York Central by the Pullman-Standard Car Manufacturing Company, train-to-anywhere telephone service will be available to passengers on the New York-Buffalo, N.Y., por-



This comparison of the old (left) with the new chilled car wheel indicates the improvement in the distribution between the chilled metal (solid light zone), the strength-possessing gray iron (dark section) and the mottle or speckled zone between these two

IN MODERNIZING STEAM MOTIVE POWER



ANY railroads are installing Security Circulators in their existing locomotives to increase steaming efficiency and to decrease boiler maintenance.

Steaming performance is improved because the additional evaporating surface aids the locomotive to get up steam more rapidly, while the quickened flow of water from the side water-legs (through the Circulators) over the crown sheet helps to maintain maximum boiler output.

Boiler maintenance is reduced because the Security Circulators definitely lessen honeycombing, flue plugging and cinder cutting. They also furnish an ideal support for a 100% brick arch and prolong the life of the brick.

SECURITY CIRCULATOR DIVISION

AMERICAN ARCH COMPANY INC.

NEW YORK • CHICAGO

tion of its run, the railroad has announced. Plans are under way to extend this radio telephone tie-up with the Bell system from Buffalo to Chicago as sufficient stations become available.

A special telephone room is being provided in the club cars built for the "Century" service. The radio connection will be made through nine fixed stations, located at New York, Mt. Kisco, Poughkeepsie, Guilderland, Fonda, Utica, Syracuse, Rochester and Buffalo. Channels will be in the 30-44 megacycle band assigned to general highway mobile radio use. Transmissions from the trains, using a special antenna, will be on a different frequency from that used from the fixed stations to the trains.

National of Mexico Plans Equipment Purchases Here

The National of Mexico is contemplating a modernization program which, it is understood, calls for the purchase in the United States of 150 locomotives (75 per cent of which will be Diesels), 2,000 freight cars and 100 passenger cars, according to a recent issue of Foreign Commerce Weekly. In addition, various equipment will be needed for 100 freight cars and for a new station to be constructed in Mexico City. Further information may be obtained from Rudolfo Flores, purchasing agent, National Railways of Mexico, Bolivar No. 19, Mexico, D.F., Mexico.

Additional General News appears on pages 162 through 168.

EQUIPMENT AND SUPPLIES

June Freight Car Deliveries Exceed 10,000

Domestic freight cars delivered during June totaled 10,387, according to the American Railway Car Institute. Total deliveries for the half year have been 55,345. Of June deliveries, 7,737 were from contract car builders and 2,650 were built in railroad shops.

In announcing that the 10,000 cars monthly goal had been achieved for the first time since the current car building program was planned in March, 1947, S. M. Felton, president of the institute said:

"Despite the achievement of a peak month, the outlook for the future is just as 'discouraging' as was indicated by Col. J. Monroe Johnson, director of the Office of Defense Transportation, in his statement on June 29 [reported

elsewhere in this issue].

"Last month's production reflected exceptionally high steel receipts in March, after the usual time lag for fabrication and assembly of cars. Because steel receipts have dropped since, it is most unlikely that the 10,000-car level can be maintained during the months immediately ahead."

June deliveries, the institute announced, included 3,361 box cars, 4,069 hoppers, 701 refrigerator, 981 gondola and 698 tank cars.

Orders placed during the month were: with the contract builders, 5,623 cars; in railroad shops, 250; total, 5,873. Total orders for the half year, 58,168 cars; as compared with 64,363 during the first six months of 1947.

Cars on order as of June 30 totaled 122,167, as compared with 109,006 one year earlier.

FREIGHT CARS

The Nashville, Chattanooga & St. Louis has ordered 500 50-ton hopper cars and 500 50-ton gondola cars from the Pullman-Standard Car Manufacturing Company.

The Alabama Great Southern, a subsidiary of the Southern, has ordered 150 65½-ft. all steel, mill-type gondolas with drop ends, from the Pressed Steel Car Company, McKees Rocks, Pa. Delivery of this equipment, which will cost approximately \$850,000, is expected the first part of 1949.

The Delaware, Lackawanna & Western has ordered 300 50-ton box cars from the Major Car Corporation, 200 50-ton box cars from the Pullman-Standard Car Manufacturing Company, and 100 70-ton covered hopper cars from the American Car & Foundry Co. Inquiry for this equipment was reported in *Railway Age* of May 1, page 57.

This road is now inquiring for 500 50-ton hopper cars.

PASSENGER CARS

The Delaware, Lackawanna & Western has ordered 20 coaches, 10 each from the Pullman-Standard Car Manufacturing Company and the American Car & Foundry Co.

LOCOMOTIVES

The Southern Pacific has ordered 95 Diesel-electric locomotives (inquiry for which was announced in *Railway Age* of June 12, page 1187) as follows: 30 6,000-hp. freight locomotives and 40 1,000-hp. switchers from the Electro-Motive Division of General Motors Corporation; 15 1,500-hp. road-switching locomotives from the Baldwin Locomotive Works and 10 70-ton switchers from the General Electric Company. Delivery is expected to begin the end of this year.

SUPPLY TRADE

Electro-Motive, Australian Firm Sign Diesel-Building Agreement

On June 23, the Electro-Motive Division of General Motors Corporation and the Clyde Engineering Company of Australia completed an agreement whereby the latter firm, in collaboration with Electro-Motive, will manufacture Diesel-electric locomotives at its works in Granville, New South Wales. The locomotives produced under the agreement will be employed in Australia and the Far East, the first of which is expected to go into service during 1950.

The Clyde Engineering Company, is described by Electro-Motive as one of the oldest large-scale manufacturers in Australia and a leading producer of steam locomotives and other transportation equipment. The working pact was signed at Electro-Motive's plant in LaGrange, Ill. Representing the two companies were C. R. Osborn, vice-president of General Motors and general manager of Electro-Motive, and Raymond Purves, chairman and managing director of the Clyde.

The Northwest Engineering Company has appointed F. A. Stoughton, 487 McCully street, Pittsburgh 16, Pa., as district sales manager in the Pittsburgh area.

F. H. Gordon, vice-president of the Lukens Steel Company, Coatesville, Pa., has retired. Mr. Gordon joined the sales department of the concern, then known as Lukens Iron & Steel Co., in 1895. In



F. H. Gordon

1903 he was appointed assistant general sales agent and, in 1907, general sales agent. He was elected a vice-president in January, 1928, in which position he continued to serve until his retirement.

Raymond Rosen & Co. has announced the formation of a new wholly-owned subsidiary company, Raymond Rosen Engi-

A *Smaller* Boiler

A *Lighter* Boiler

A *Smaller* Investment

These three worthwhile advantages are obtained when small-flue superheaters are specified in preference to other designs. Theory and performance are both in accord on these advantages.

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July 10, 1948

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neering Products, Inc., to handle all of the business formerly handled by the firm's engineering products division. Raymond Rosen is president of the new company and Louis P. Clark, formerly general manager of the engineering products division, has been appointed vice-president and general manager. Thomas F. Joyce is secretary and Joseph Wurzel is treasurer.

Frank H. Bonnet has been elected president and general manager of the Buckeye Steel Castings Company, to succeed George T. Johnson, who has resigned due to ill health.

Mr. Bonnet joined the company as a molder's helper in the foundry, after graduating in 1909 from Ohio State University as a mechanical engineer. He worked in various capacities until his appointment as first vice-president and works manager, a position he has held for several years. Mr. Johnson has been associated with Buckeye Steel Castings for 42 years. He served in the operating and engineering departments and as head of the sales department and has been chief executive of the company for the past three years. He will continue on the board of directors.

CONSTRUCTION

Chicago Union Station.—This company has announced a \$800,000 improvement program, which will include the laying of an additional entrance track and the lengthening of two other tracks to accommodate 18 and 19 cars, respectively. Some \$50,000 is to be spent to equip train gates with electric-eye door openers, the completion of which is expected by August 1. The entire program is expected to be completed before the end of the year.

CAR SERVICE

Railroad agreements "to effect further improvements in car handling" have been extended without change for another six months, i.e., until December 31. The agreements, filed with the Interstate Commerce Commission early this year, resulted in cancellation, before it became effective, of the commission's proposed Service Order No. 778, which would have prescribed railroad operating regulations for car movement. The extensions of the agreements were effected by assents to the later expiration date, filed with the commission by the individual roads, as recommended recently by President William T. Faricy of the Association of American Railroads (see *Railway Age* of June 26, page 135).

I.C.C. Service Order No. 790-A, effective June 29, vacated Service Order No. 790, which had authorized the director of the commission's Bureau of Service to require the furnishing of cars to mines for railroad-fuel loading without regard to car-distribution rules. The order had been scheduled to expire November 30.

Revised I.C.C. Service Order No. 815 on July 1 supplanted Service Order No. 815. The original order required the railroads to include Sundays and holidays in computing free time on loaded coal cars held for dumping into vessels at Great Lakes ports. The revised order continues in effect all of the provisions of the original order and makes them apply to cars loaded with coke as well as coal.

Revised I.C.C. Service Order No. 396 on July 1 supplanted Service Order No. 396. The original order required the reconsignment of refrigerator cars within 48 hours from the first 7 a.m. after arrival at a diversion point. The revised order carries the same general provisions, but exempts Saturdays, as well as Sundays and bank holidays, from consideration in the computation of the 48-hour period allowed for reconsignments.

I.C.C. Service Order No. 816 has been modified by Amendment No. 1, which set back the expiration date from July 1 until July 20. The order provides for the suspension of demurrage rules on freight and express cars in the Northwest, which were held up because of flood conditions.

I.C.C. Service Order No. 68, which relates to minimum weights, trailer cars, etc., has been modified by Amendment No. 19 which set back the expiration date of Amendment No. 18 from June 30 until July 31. The amendment thus extended suspends the order's provisions in so far as they apply to flat cars loaded with trailers shipped to points in Oregon and Washington and between points in those states.

I.C.C. Service Order No. 775, which provides for super-demurrage charges on all types of freight cars, has been modified by Amendment No. 3 which suspends the application of such charges to refrigerator cars used for the transportation of perishable commodities.

I.C.C. Service Order No. 684, which imposes restrictions on lighterage services in New York harbor, has been modified by Amendment No. 4, which set back the expiration date from June 30 until December 31.

The A.A.R. Car Service Division's Special Car Order No. 49, which has required the expedited return home from the East of plain box cars of the XM type owned by southwestern roads, has been modified by Supplement No. 2. The modification brings the order into line with the shifting wheat harvest by making it applicable to cars owned by central-western and northwestern roads and eliminating the

coverage or cars owned by southwestern roads.

Chairman A. H. Gass of the Car Service Division, A.A.R., issued a June 26 circular asking all railroads, "until further notice and on request of O.D.T. and I.C.C.," to observe the following regulations with respect to furnishing refrigerator cars for shipments of Irish potatoes: (1) Do not place cars for loading except upon written car order which car order shall contain assurance that the car or cars placed will be billed within 24 hours after completion of loading; (2) in the event cars loaded are not billed within 24 hours, do not furnish any additional empties for loading until all cars held under load have been billed; (3) in the event partly loaded cars are held 24 hours, do not furnish any additional empties until the partially-loaded cars are loaded and billed.

FINANCIAL

New Securities

Division 4 of the I.C.C. has authorized: **Pennsylvania.**—To assume liability for \$17,570,000 of series F 3½ per cent general mortgage bonds, which its lessor, the Philadelphia, Baltimore & Washington, has been given authority to sell. Proceeds from the sale of the bonds will be applied toward the repayment of advances made by the Pennsylvania to its lessor, such advances having totaled \$42,755,813 as of December 31, 1947. The bonds will be dated May 1 and will mature May 1, 1979. They will be redeemable at 105 on or before May 1, 1956; thereafter on or before May 1, 1975, at their principal amount plus a premium equal to ¼ of 1 per cent for each year or part thereof between the designated redemption date and November 1, 1975; and thereafter at their principal amount if redeemed on or after November 1, 1975. For sinking fund purposes, they will be redeemable at 102½ on any May 1 from 1949 to and including May 1, 1956; at their principal amount plus a premium of ⅛ of 1 per cent for each year between the designated redemption date and May 1, 1976, if redeemed on any May 1 from 1957 to and including May 1, 1975; and at their principal amount if redeemed on any May 1 between 1976 and 1978, inclusive. The bonds have been sold to the Equitable Life Assurance Society, its bid being par and accrued interest for the bonds, bearing interest at the rate of 3½ per cent yearly.

Application has been filed with the Interstate Commerce Commission by:

Richmond, Fredericksburg & Potomac.—To assume liability for \$2,400,000 of equipment trust certificates, the proceeds of which will be applied toward the purchase of 10 1,000-hp. Diesel-electric switching locomotives and 17 all-steel passenger cars, estimated to cost \$3,017,000. The locomotives will be acquired from the American Locomotive Company at an estimated unit cost

THIS IS NOT NEWS!

22 New Lima Locomotives For L & N Use H-S Products HSGI Cylinder Bushings and Light Weight Steel Pistons for Largest Recent Steam Locomotive Order

By Special Correspondence

BOSTON — Biggest order of its kind placed by any American railroad so far in 1948 recently went to the Lima-Hamilton Corporation for 22 steam locomotives of the 2-8-4 class. Destined for service on the Louisville and Nashville railroad, these locomotives...

Hunt-Spiller Mfg. Corporation of South Boston, Mass., makers of air furnace gun iron and specialized steel castings, will supply cylinder bushings and steel pistons for the new locomotives. Hunt-Spiller is well-known in the railroad supply field, having furnished locomotive components to the maintenance of way...

Hunt-Spiller are exclusive railroad sales representatives for Double Seal Piston Rings made for Diesel and other services. Double Seal rings are cast from Hunt-Spiller Air Furnace Gun Iron.

The usual and expected is seldom worthy of comment. After all, just about every steam locomotive the L & N owns has some Hunt-Spiller products on it, and this has been true for some thirty-eight years. So you may be sure that "The Old Reliable" needed no further convincing of the excellence and dependability of Hunt-Spiller products for its new locomotives.

The long-standing preference of the Louisville and Nashville is just one example of a general railroad practice, for most Class I American roads have been Hunt-Spiller customers since the early years of the century.



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for Diesel Service

Dunbar Sectional Type Packing
Duplex Sectional Type Packing
for Cylinders and Valves
(Duplex Springs for Above
Sectional Packing)
Cylinder Snap Rings
Valve Rings, All Shapes

of \$97,000. The passenger equipment is as follows:

Description and Builder	Estimated Unit Cost
Foundry Co.)	\$127,000
ing car (American Car & Co.)	\$127,000
1 2-drawing-room, 14-roomette sleeping car (A. C. F.)	125,000
3 coaches (Pullman-Standard Car Manufacturing Co.)	95,000
1 dining car (Pullman-Standard) ..	137,000
7 6-double-bedroom, 10-roomette sleeping cars (Pullman-Standard) ..	125,000
1 21-roomette sleeping car (Pullman-Standard)	135,000
3 6-double-bedroom, 10-roomette sleeping cars (Pullman-Standard) ..	121,000

The certificates will be dated September 1 and will mature in 40 quarterly payments, starting December 1. They have been sold to Halsey, Stuart & Co. on a bid of 100.319 with a 2¼ per cent interest rate.

Dividends Declared

Atchison, Topeka & Santa Fe.—\$1.50, payable September 1 to holders of record July 30.
 Minneapolis & St. Louis.—25¢, payable July 15 to holders of record July 9.
 South Western.—\$2.50, semi-annually, payable July 1 to holders of record June 15.

Average Prices Stocks and Bonds

	July 6	Last week	Last year
Average price of 20 representative railway stocks	51.06	54.78	48.28
Average price of 20 representative railway bonds	91.46	91.29	89.21

RAILWAY OFFICERS

EXECUTIVE

Emil Von Bergen, assistant to vice-president and general manager of the Illinois Central at Chicago, will retire on July 15, following 57 years of service with the road. The duties previously performed by Mr. Von Bergen will be assigned to the general superintendent of transportation.

William H. Wenneman has resigned as vice-president in charge of finance and corporate relations of the Chesapeake & Ohio at Cleveland, Ohio.

FINANCIAL LEGAL and ACCOUNTING

R. H. Waterman has been appointed tax commissioner of the Texas & Pacific, International-Great Northern and the Gulf Coast Lines, with headquarters at Dallas, Tex., succeeding W. H. Holder, who has retired.

C. E. Blair, auditor of disbursements of the St. Louis-San Francisco, with headquarters at St. Louis, Mo., has been appointed general auditor at that point. A. E. Hoehle has been appointed auditor of disbursements and G. E. Kirkmen becomes assistant auditor of disbursements.

ENGINEERING and SIGNALING

W. M. Jaekle, division engineer of the Southern Pacific's Coast division, with headquarters at San Francisco, Cal., has been appointed construction engineer, to supervise the construction of the road's relocation around Meridian Dam Reservoir, between Oakridge, Ore., and Eugene, and other work as assigned. He is succeeded by J. E. Wheeler, division engineer at Dunsmuir, Cal., who in turn is replaced by K. C. Brunner.

B. R. Meyers, assistant to chief engineer of the Chicago & North Western at Chicago, has been promoted to assistant chief engineer at that point, succeeding R. R. Strother, who has retired after 39 years of service with the road. Mr. Meyers is succeeded by H. W. Jensen, division engineer at Chicago. J. P. Datesman, division engineer at Green Bay, Wis., has been transferred to Chicago, and William Wilbur, acting division engineer at Chadron, Neb., has replaced Mr. Datesman at Green Bay. W. V. Kerns, who has been on leave of absence from his post as division engineer at Chadron, has returned to his position there.

MECHANICAL

D. E. Holcomb has been appointed master mechanic—general foreman of the Union Terminal and the St. Joseph Belt, with headquarters at St. Joseph, Mo.

L. W. Van Natta, supervisor of Diesel equipment of the Kansas City Southern at Pittsburg, Kan., has been appointed superintendent of Diesel equipment at that point. W. H. Bruening, master mechanic at Pittsburg, has been advanced to assistant superintendent of Diesel equipment there.

OPERATING

James H. Kline has been appointed superintendent of the Lake Superior & Ishpeming at Marquette, Mich.

Charles D. Miller, general yardmaster of the Denver & Rio Grande Western at Salt Lake City, Utah, has been appointed assistant superintendent at that point, succeeding Richard S. James, who has been advanced to superintendent of safety and fire prevention—system, at Denver, Colo.

Otis D. Teeter, fuel supervisor of the Denver & Rio Grande Western, at Denver, Colo., has been promoted to superintendent of fuel conservation at that point, succeeding William J. Tapp, who has retired after 56 years of railroad service. S. M. Langford, assistant to superintendent of the Pueblo division, in charge of safety matters, has been appointed assistant fuel supervisor.

TRAFFIC

Raymond E. Hibbard, assistant to vice-president of the Chicago, Milwaukee, St. Paul & Pacific, at Chicago, has been appointed assistant general freight agent at that point, succeeding G. W. Myers, who has retired after more than 43 years of railroad service. Mr. Hibbard is succeeded by Philip J. Cullen, assistant general freight agent at Chicago, who in turn is replaced by E. W. Chesterman, an employee in the freight traffic department since 1924.

W. R. Roberts, city freight agent of the Chicago, Rock Island & Pacific at Philadelphia, Pa., has been appointed general agent at Cleveland, Ohio, succeeding R. R. Shaeffer, who has been appointed division freight agent at Estherville, Iowa. Mr. Shaeffer succeeds A. A. Halleck, who has retired after 45 years of service with the road.

OBITUARY

Charles H. Morse, assistant engineer maintenance of way of the New York Central system at New York, died on June 30 on a train enroute to his home in Yonkers, N. Y., at the age of 62.

John E. Courtney, who retired as western traffic manager of the Denver & Rio Grande Western in June, 1947, died at San Francisco, Cal., on May 29.

C. E. Lennon, traffic manager of the Texas Electric, with headquarters at Dallas, Tex., died recently.

Leslie Bennett McDonald, vice-president in charge of operations of the Southern Pacific Lines at San Francisco, Cal., died suddenly in Oakland, Cal., on July 5, at the age of 64.

Oran H. Nance, president of the Maryland & Pennsylvania and the Canton railroad and regional vice-president of the American Shortline Railroad Association, with headquarters at Baltimore, Md., died on June 27, as reported in the *Railway Age* of July 3. Mr. Nance was born in Leon county, Tex., on July 18, 1879, and attended Add Ran Christian University (now Texas Christian). He entered railroad service 1898 as clerk-telegrapher with the Chicago, Rock Island & Pacific, going with the Chicago, Rock Island & Gulf in 1900 and with the Trinity & Brazos Valley (now Burlington-Rock Island) in 1907 and becoming treasurer of the T. & B.V. in 1908. From 1909 to 1915 Mr. Nance was auditor and treasurer of the St. Louis, Brownsville & Mexico at Kingsville, Tex., becoming president of the Maryland & Pennsylvania in 1915, which position he held until his death. In 1928 Mr. Nance was appointed vice-president and general manager of the Canton railroad, becoming president in 1931. He had been vice-president of the Eastern region of the American Short Line Railroad Association since 1935.

Announcing

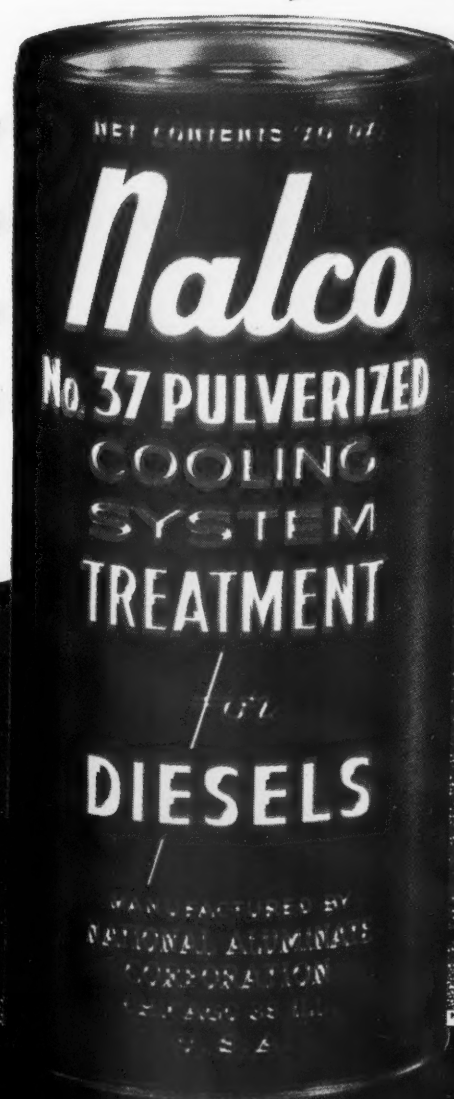
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OPERATING REVENUES AND OPERATING EXPENSES OF CLASS I STEAM RAILWAYS

Compiled from 127 monthly reports of revenues and expenses representing 131 Class I steam railways.

(Switching and Terminal Companies Not Included)

FOR THE MONTH OF APRIL 1948 AND 1947

Item	United States		Eastern District		Southern District		Western District	
	1948	1947	1948	1947	1948	1947	1948	1947
Miles of road operated at close of month.....	227,204	227,464	53,699	53,729	46,162	46,147	127,343	127,588
Revenues:								
Freight.....	\$601,375,640	\$565,013,174	\$226,206,683	\$219,601,003	\$118,564,709	\$114,002,378	\$256,604,248	\$231,409,383
Passenger.....	69,490,190	70,414,909	35,092,108	35,583,049	11,580,067	11,953,146	22,818,015	22,578,514
Mail.....	15,499,223	11,885,580	5,639,899	4,646,025	2,732,391	2,079,510	7,126,933	5,159,145
Express.....	10,874,958	11,784,913	4,118,378	3,680,481	1,797,026	2,643,775	4,959,554	5,460,657
All other operating revenues.....	31,728,948	31,236,388	13,938,160	13,930,705	5,445,842	5,479,095	12,344,946	11,826,588
Railway operating revenues.....	728,968,959	690,334,954	284,995,228	277,442,163	140,120,035	136,157,904	303,853,696	276,734,287
Expenses:								
Maintenance of way and structures	106,772,738	97,622,356	36,746,672	34,324,055	21,779,279	22,168,594	48,246,787	41,129,707
Depreciation.....	10,309,563	10,148,940	4,372,775	4,356,883	1,785,502	1,733,619	4,151,286	4,058,438
Retirements.....	1,750,776	645,377	424,127	122,369	121,955	140,321	1,204,694	382,687
Deferred maintenance.....	*427,889	*458,870	*27,260	*15,236	*113,360	*34,458	*287,269	*409,176
Amortization of defense projects.....	141,469	88,388	10,507	7,161	42,955	25,290	88,007	55,937
Equalization.....	*2,040,177	*538,558	*193,664	369,470	*872,156	*793,119	*974,357	*114,909
All other.....	97,038,996	87,377,079	32,160,187	29,483,408	20,814,383	21,096,941	44,064,426	37,156,730
Maintenance of equipment.....	132,725,269	127,664,695	55,503,670	55,560,512	26,041,692	25,268,846	51,179,905	46,835,337
Depreciation.....	20,463,985	19,156,630	8,065,773	7,790,106	4,510,783	4,179,903	7,887,429	7,186,621
Retirements.....	*41,685	*23,058	*1,988	*1,835	*11,451	*8,942	*28,246	*12,281
Deferred maintenance and major repairs.....	*382,236	*372,599		*39	*76,702	*74,047	*305,534	*298,513
Amortization of defense projects.....	1,225,200	1,250,969	452,342	467,865	238,927	250,524	533,931	532,580
Equalization.....	251,920	213,380	56,457	42,928	271,406	170,727	*75,943	*275
All other.....	111,208,083	107,439,373	46,931,086	47,261,487	21,108,729	20,750,681	43,168,268	39,427,205
Traffic.....	16,320,866	14,547,422	5,429,839	5,128,132	3,573,002	3,043,865	7,318,025	6,375,425
Transportation—Rail line.....	296,685,637	273,651,527	125,280,754	120,052,272	53,971,546	50,643,769	117,433,337	102,955,486
Miscellaneous operations.....	10,223,324	9,940,474	3,817,382	3,692,612	1,662,108	1,575,350	4,743,834	4,672,512
General.....	22,897,639	20,138,354	8,830,096	7,752,828	4,951,354	4,437,437	9,116,189	7,948,089
Railway operating expenses.....	585,625,471	543,564,828	235,608,413	226,510,411	112,978,981	107,137,861	238,038,077	209,916,556
Net revenue from railway operations.....	143,343,488	146,770,126	49,386,815	50,932,352	28,141,054	29,020,043	65,815,619	66,817,731
Railway tax accruals.....	75,356,189	72,741,743	27,599,111	25,549,953	15,708,866	15,751,480	32,048,212	31,440,310
Pay-roll taxes.....	29,265,713	28,183,155	11,894,967	11,772,185	5,669,120	5,675,392	11,701,626	10,835,578
Federal income taxes.....	20,205,989	21,600,082	6,034,413	4,971,376	4,443,476	5,246,747	9,728,100	11,381,959
All other taxes.....	25,884,487	22,958,506	9,669,731	8,806,392	5,596,270	4,929,341	10,618,486	9,222,773
Railway operating income.....	67,987,299	74,028,383	21,787,704	25,382,399	12,432,188	13,268,563	33,767,407	35,377,421
Equipment rents—Dr. balance.....	11,574,516	11,112,719	5,444,674	5,560,247	64,686	55,367	6,065,156	5,497,107
Joint facility rent—Dr. balance.....	3,308,711	3,456,124	1,524,138	1,739,592	495,496	524,205	1,289,077	1,192,327
Net railway operating income.....	53,104,072	59,459,540	14,818,892	18,082,560	11,872,006	12,688,991	26,413,174	28,687,989
Ratio of expenses to revenue (per cent)	80.3	78.7	82.7	81.6	79.9	78.7	78.3	75.9

Item	United States		Eastern District		Southern District		Western District	
	1948	1947	1948	1947	1948	1947	1948	1947
Miles of road operated at close of month.....	227,216	227,546	53,699	53,732	46,158	46,227	127,359	127,587
Revenues:								
Freight.....	\$2,446,976,791	\$2,227,126,291	\$935,852,936	\$853,165,165	\$513,533,981	\$481,508,064	\$997,589,874	\$892,453,062
Passenger.....	296,850,494	295,046,311	150,637,412	145,634,617	51,416,829	53,856,262	94,796,253	95,555,432
Mail.....	60,228,283	45,762,040	21,435,158	17,328,680	10,855,786	8,161,324	27,937,339	20,272,036
Express.....	40,915,545	40,630,020	12,814,283	12,521,878	7,871,292	8,296,082	20,229,970	19,712,060
All other operating revenues.....	127,239,383	122,391,438	56,216,960	54,251,467	22,176,615	21,511,339	48,845,808	46,628,632
Railway operating revenues.....	2,972,210,496	2,730,856,100	1,176,956,749	1,082,901,807	605,854,503	573,333,071	1,189,399,244	1,074,621,222
Expenses:								
Maintenance of way and structures	409,075,851	360,863,515	147,544,977	128,544,970	89,217,093	83,541,375	172,313,781	148,777,170
Depreciation.....	41,216,306	40,507,891	17,506,157	17,333,270	7,141,100	6,937,081	16,569,049	16,237,540
Retirements.....	3,316,610	1,706,804	764,629	471,306	356,932	301,416	2,195,049	934,082
Deferred maintenance.....	*1,546,409	*1,405,594	*65,892	*129,846	*612,457	*110,952	*868,060	*1,164,796
Amortization of defense projects.....	842,527	400,811	47,203	33,002	171,546	112,482	623,778	255,327
Equalization.....	9,775,503	13,362,219	5,186,545	7,533,801	2,112,756	2,589,377	2,476,202	3,239,041
All other.....	355,471,314	306,291,384	124,106,335	103,303,437	80,047,216	73,711,971	151,317,763	129,275,976
Maintenance of equipment.....	550,709,367	499,776,580	233,921,346	215,741,659	110,602,884	101,841,400	206,185,137	182,193,521
Depreciation.....	80,319,781	75,874,895	31,513,187	30,705,692	17,872,038	16,532,725	30,934,556	28,636,478
Retirements.....	*440,742	*108,857	*36,420	*14,337	*100,443	*37,254	*303,879	*57,266
Deferred maintenance and major repairs.....	*1,626,391	*1,309,952		*2,839	*353,735	*296,785	*1,272,656	*1,010,328
Amortization of defense projects.....	4,947,823	5,010,508	1,808,163	1,875,598	956,642	999,073	2,183,018	2,135,837
Equalization.....	1,718,002	1,573,888	350,479	240,167	1,225,729	1,213,640	141,794	120,081
All other.....	465,790,894	418,736,098	200,285,937	182,937,378	91,002,653	83,430,001	174,502,304	152,368,719
Traffic.....	63,228,838	56,338,262	21,055,991	19,524,470	14,232,333	12,024,444	27,940,514	24,789,348
Transportation—Rail line.....	1,250,546,142	1,105,003,028	536,983,096	485,499,177	233,220,630	209,434,370	480,342,416	410,069,481
Miscellaneous operations.....	43,253,415	40,889,790	16,352,482	15,129,514	7,195,553	6,582,929	19,705,380	19,777,347
General.....	89,782,403	78,845,199	34,334,610	30,446,010	19,527,101	17,078,246	35,920,692	31,320,943
Railway operating expenses.....	2,406,596,016	2,141,716,374	990,192,502	894,885,800	473,995,594	430,502,764	942,407,920	816,327,810
Net revenue from railway operations.....	565,614,480	589,139,726	186,764,247	188,016,007	131,858,909	142,830,307	246,991,324	258,293,412
Railway tax accruals.....	312,579,377	299,746,728	110,940,530	101,626,866	70,733,952	72,624,531	130,904,895	125,495,331
Pay-roll taxes.....	121,139,799	112,194,196	50,429,964	47,067,557	23,812,762	22,229,122	46,897,073	42,897,517
Federal income taxes.....	91,543,591	96,597,435	23,398,469	19,456,040	25,598,376	31,038,615	42,546,746	46,102,780
All other taxes.....	99,895,987	90,955,097	37,112,097	35,103,269	21,322,814	19,356,794	41,461,076	36,495,034
Railway operating income.....	253,035,103	289,392,998	75,823,717	86,389,141	61,124,957	70,205,776	116,086,429	132,798,081
Equipment rents—Dr. balance.....	43,600,844	39,729,415	21,787,715	20,339,220	*2,816,754	*1,165,444	24,629,883	20,555,639
Joint facility rent—Dr. balance.....	13,683,608	13,960,103	6,444,464	6,817,410	2,070,556	2,215,218	5,168,588	4,927,480
Net railway operating income.....	195,750,651	235,703,475	47,591,538	59,232,511	61,871,155	69,156,002	86,287,958	107,314,962
Ratio of expenses to revenue (per cent)	81.0	78.4	84.1	82.6	78.2	75.1	79.2	76.0

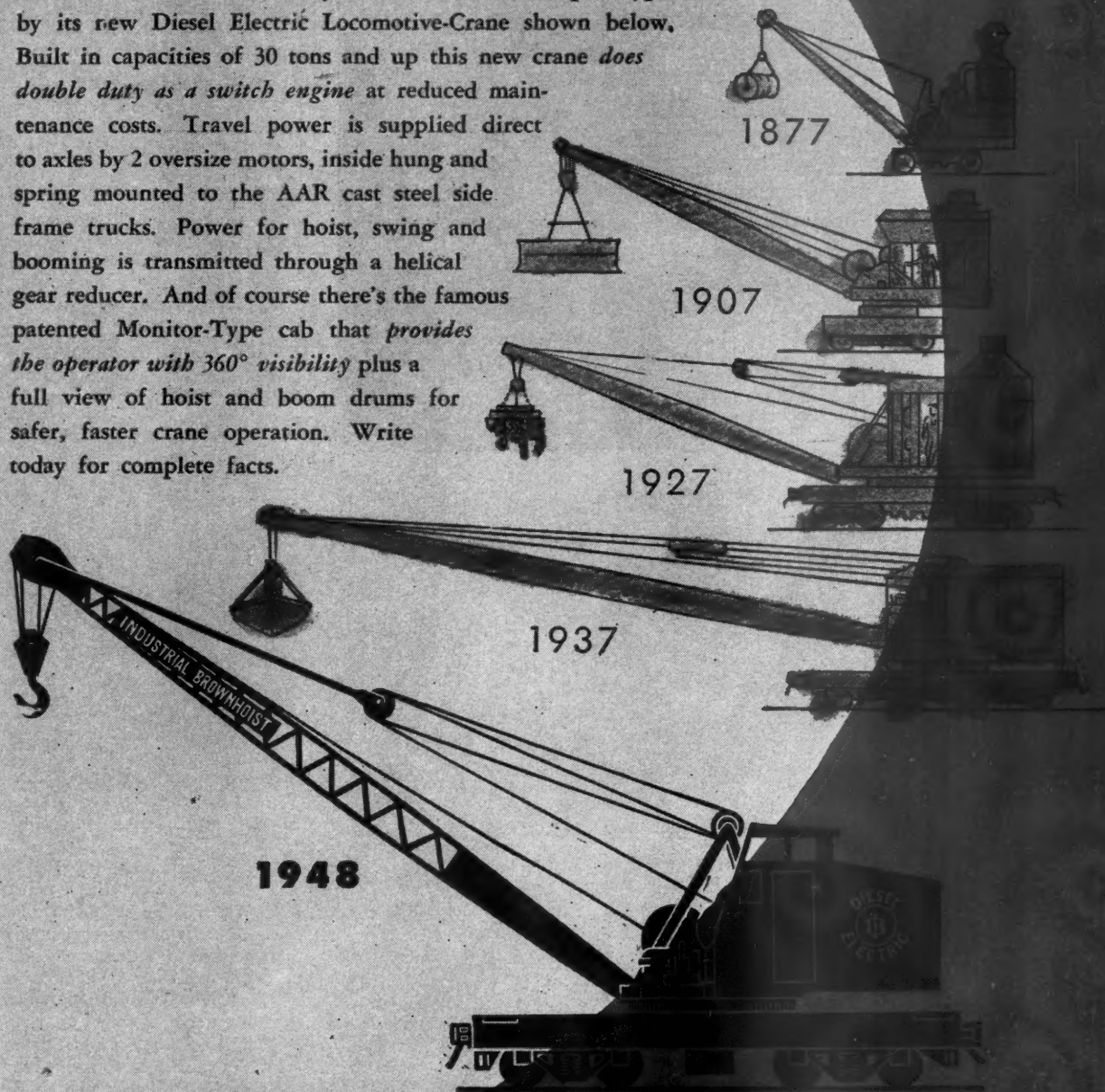
*Decrease, deficit, or other item.

Compiled by the Bureau of Transport Economics and Statistics, Interstate Commerce Commission. Subject to Revision.

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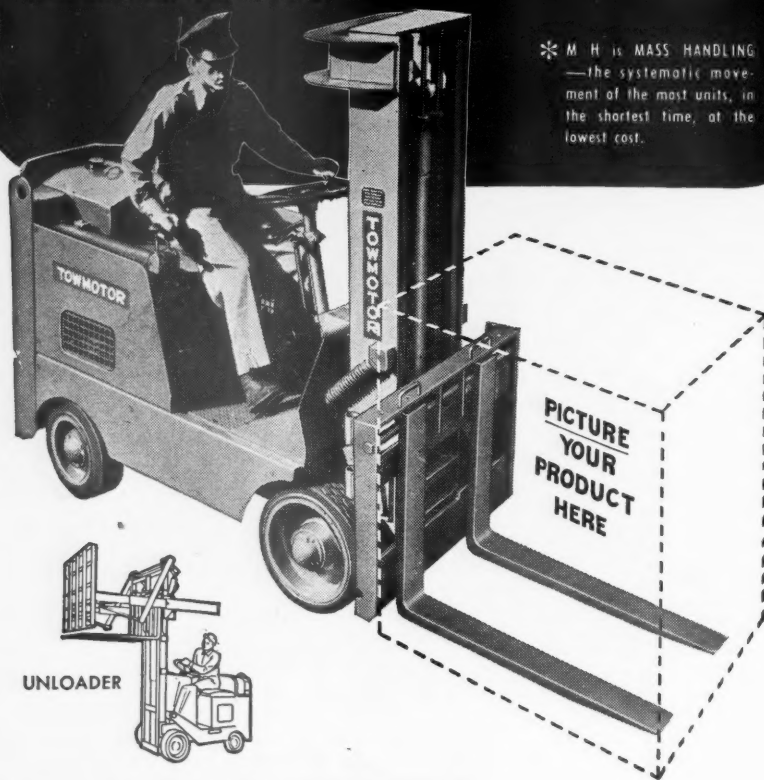
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5 Months Income

(Continued from page 152)

a net income of \$19,000,000 in May, 1947.

The same roads in the five months had a net railway operating income of \$120,243,238, compared with \$137,169,651 in the same period of 1947. Their net railway operating income in May amounted to \$33,955,280, compared with \$29,854,689 in May, 1947.

Gross in the Western district in the five months totaled \$1,492,816,494, an increase of 10 per cent compared with the same period of 1947, while operating expenses totaled \$1,181,789,336, an increase of 14.5 per cent.

CLASS I RAILROADS — UNITED STATES Month of May

	1948	1947
Total operating revenues ... \$	796,402,811	725,387,748
Total operating expenses ...	616,231,264	557,617,846
Operating ratio —per cent .	77.38	76.87
Taxes	75,966,676	76,893,851
Net railway operating income (Earnings before charges)	90,178,066	76,818,499
Net income, after charges (estimated) .	63,700,000	49,000,000

Five months ended May 31, 1948

Total operating revenues ... \$	3,768,613,307	\$3,456,243,848
Total operating expenses ...	3,022,827,278	2,699,334,219
Operating ratio —per cent .	80.21	78.10
Taxes	388,546,053	376,640,579
Net railway operating income (Earnings before charges)	285,928,720	312,521,976
Net income, after charges (estimated) .	165,000,000	180,000,000

Rail Labor Injunction

(Continued from page 148)

Secretary Royall on May 10 and 11. "The authority of the secretary of the army," he said, "is governed by the law and not by anything in any more or less desultory conversation which took place between him and the heads of the brotherhoods."

"The secretary of the army," he continued, "took the position that he didn't think he should interfere as long as the President was conducting the negotiations with Dr. Steelman's assistance, and that is all he meant by anything he may have said at this meeting; but the court wants to emphasize the fact that the court thinks that his power to act is controlled by law, and in view of the fact that the government had taken over the railways he had the authority to act on behalf of the government and take such action as seemed to be wise and proper under the circumstances. The court doesn't think at all that the fact that the government didn't see fit to change and alter the railway set-up throughout the country but decided to allow the railroads to be conducted in the usual manner unless and until it was finally determined that the negotiations would not be successful does not in any way indicate that the United States didn't

have actual control of the railroads and weren't actually the employers of the employees of the railroads."

Royall's Power Recognized

According to Justice Goldsborough, Secretary Royall, who testified at the hearing, has permitted and encouraged Dr. Steelman's efforts to mediate the dispute in the belief that, if the managements and unions reach an agreement, the federal government would be able to return the seized transportation systems with the assurance that there will be no interruption in the transportation service necessary to the national health, safety and welfare. Secretary Royall, he said, has been aware of his power under the President's executive order to fix wages, hours and terms and conditions of employment of the employees performing services on the affected transportation systems. He also outlined extensively the actions taken by Secretary Royall incident to the assumption by the government of possession, operation and control of the railroads, including the lifting of certain embargoes and the establishment of seven regional administrative systems. Justice Goldsborough also held that the strike, if permitted to occur, would, among other things, (1) result in a work stoppage in virtually the entire railway system of the nation; (2) deprive the armed forces of supplies and materials and mobility of personnel necessary to the operations of the military at home and in the occupied countries abroad; (3) prevent the United States from carrying out the Economic Cooperation Act and other rehabilitation programs; (4) interfere with and obstruct the effective performance and discharge of vital and necessary governmental functions and frustrate the powers conferred by the Constitution and acts of Congress upon the government's executive branch; and (5) imperil the national health and safety. "Unless the threatened strike is enjoined," he held, "the United States will suffer irreparable injury for which it has no adequate remedy at law."

Secretary Royall, the first of several government witnesses to testify, told the court that few operational problems have arisen since the government assumed control of the carriers. He said that while the Executive Order gave him authority to negotiate a settlement of the dispute, he advised the three union leaders that he would refrain from such action so long as Dr. Steelman, acting on behalf of President Truman, was handling the proceeding. In this connection, Secretary Royall said he has been in constant touch with Dr. Steelman since the latter undertook to mediate the dispute.

"Practical" Method of "Control"

According to Secretary Royall, any agreement reached between the unions and management as the result of Dr. Steelman's efforts would have to be

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approved either by himself or the president so long as the Executive Order remains effective. "I haven't indicated to Dr. Steelman what to say or what line should be followed," he added, "although I do have the authority, under the executive order to fix wages and working conditions."

Secretary Royall also told the court that the Department of the Army has utilized private management as much as possible in running the railroads, adding, that the Transportation Corps has "watched the situation closely" and submitted daily reports to him. The utilization of private management, he contended, was the most "practical" method of operating the railroads under government control, although he declared that, under the terms of the Executive Order, he has "full authority" to change any present policy or action and take over any railroad for operation by the military. He also declared that he did not inquire of the brotherhoods in May as to whether or not they would amend their strike order so as to permit members of their union to serve on trains carrying mail and military supplies.

According to Secretary Royall, the government does not intend "at this time" to negotiate new contract terms with the three unions. The government, he said, instead is trying to "mediate a private agreement between the parties . . . because we feel this is the most practical way." He said he had "fervent hopes" that the parties will reach an agreement, adding that the government does not intend to relinquish operation of the roads until a settlements is reached. Asked whether the government is considering entering into direct negotiations with the unions "in the near future," he replied that he did not want to "indicate or bind" himself to future course of action.

The union leaders, meanwhile, contradicted Secretary Royall's testimony when they told the court, as they had stated in their documentary pleadings, that the secretary had advised them that he had no authority to negotiate a settlement of the dispute. Mr. Johnston also informed Justice Goldsborough that there probably would not be an immediate strike if the court refrained from granting the permanent injunction. If the petition for a permanent injunction is denied, Mr. Johnston said, he would begin immediate negotiations with the carriers. He added that he believed a settlement could be reached because, he said, both the unions and management are cognizant of the "seriousness" of the situation.

Weakening on Strike Plan

Mr. Johnston testified that, if negotiations with the carriers failed, he would first obtain the "attitude of the men" before serving another strike notice. Counsel for the unions also asked Mr. Robertson what would occur if no injunction were granted, but the court upheld the government's ob-

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jection to that question, although it had not protested when the same question was directed toward Mr. Johnston.

In addition to Secretary Royall, other witnesses called by the government included C. R. Megee, director of the Office of Defense Transportation's Railway Transport Department; G. E. Miller, representing the Post Office Department; Colonel L. A. Finlay of the Transportation Corps; A. E. Lyon, executive secretary of the R.L.E.A.; J. T. Corbett, assistant grand chief engineer and national legislative representative, B. of L.E.; A. A. McBride, vice president and national legislative representative of the B.L.F.&E.; and R. C. Thomas, president of a Washington, D.C., local affiliate of the B.L.F.&E.

According to Mr. Megee, a strike by the three unions would bring rail transportation to a standstill and also would have a serious effect on other forms of transportation, most of which, he said, are dependent upon the railroads for their fuel supply. Mr. Miller testified with respect to the backlog of mail which would accumulate if the railroads were tied up by a strike. In fiscal 1947, he said, the railroads moved 90 per cent of the 8,004,000,000 pounds of mail transported that year. In the event of a strike, Mr. Miller said, the Post Office Department planned first to fly as much mail as possible and move the remainder by motor vehicle. In this respect, however, he also noted that both the air lines and motor carriers were dependent upon the railroads for their fuel.

Colonel Finlay testified that a strike would "greatly imperil" the armed forces and would be a detriment to the Selective Service Act of 1948, under which, he said, the Army is attempting to rebuild its diminished manpower. After reviewing the role which the Transportation Corps has played in the current dispute, he said that, on the basis of post-World War I experience, private management is "best capable" of operating the railroads.

Messrs. Corbett, McBride, Thomas and Lyon described in detail the duties which they perform in Washington as officers of their respective organizations. Mr. Lyon said the R.L.E.A. could be classified as a trade organization, although, he added, it is "not as big" as the Association of American Railroads or the National Association of Manufacturers.

Truman Asks Sawyer to Establish Defense Steel Allocation Program

President Truman has stated that he does not consider it appropriate "at this time" to invoke his authority to require the steel industry to allocate steel to companies holding defense orders. Such authority was given to the President under the provisions of the recently-enacted Selective Service Act of 1948, as reported in *Railway Age* of June 26, page 122.

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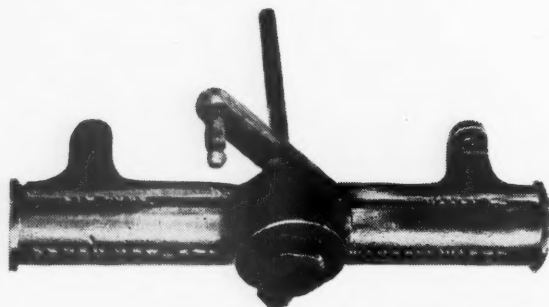


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The President's views were made known in a July 1 letter to Secretary of Commerce Sawyer. The letter asked the secretary to proceed immediately to develop a voluntary allocations program covering the requirements of the armed forces for steel mill products and steel contained in manufactured products. In setting up such a program, the President told Secretary Sawyer, it is essential that adequate provisions be made to insure that small businesses are in a position to bid on orders for the armed forces on equal terms with larger producers, insofar as the availability of steel to meet their production requirements for such orders is concerned.

At the same time, however, the President said he was prepared to exercise his authority should it prove necessary. "However," his letter continued, "the Secretary of Defense has advised me that the presently planned procurement programs of the armed services will require about 2 per cent of anticipated steel production in the fiscal year beginning July 1, 1948, and less than 3 per cent in the fiscal year 1950. It should be possible to insure fulfillment of a program of this limited size through the voluntary cooperation of industry."

The President's letter recalled that the Secretary of Commerce has already put into effect a number of voluntary allocations programs, whereas under the Selective Service Act mandatory authority would be exercised through the Secretary of Defense. "It is highly desirable," he said, "that all governmental operations relating to allocations of steel be concentrated in a single agency, and that the several allocation programs be coordinated and integrated into a single, over-all program." In this connection, he said that it will be necessary for the Department of Commerce to work in the "closest possible cooperation" with the National Military Establishment in the preparation and execution of the program.

Meanwhile, inclusion of the steel allocation provision in the act has been denounced by Senator Wherry, Republican of Nebraska, and chairman of the Senate Small Business Committee. Declaring that the provision is "unnecessary" and "an opening wedge to a broader program of undesirable economic controls," he said he sees it as "impossible of administration by the Secretary of Defense, without saddling the industry with an involved War Production Board set up."

Freight Operating Statistics For March, 1948 and 1947

The tabulation of freight operating statistics of large steam railways which appeared in *Railway Age* of June 26, page 148, was for the months of March, 1948 and 1947, and not for January, as the head erroneously stated. The figures for January appeared in *Railway Age* of May 1, page 74.

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Freight Car Loadings

Revenue carloading totals for the week ended July 3 were not available when this issue went to press.

Loadings of revenue freight for the week ended June 26 totaled 888,582 cars, and the summary for that week as compiled by the Car Service Division, A.A.R., follows:

Revenue Freight Car Loading For the Week Ended Saturday,			
District	1948	1947	1946
Eastern	158,822	158,069	164,013
Allegheny ..	183,291	185,023	186,096
Poconantas ..	69,738	40,299	72,290
Southern ..	136,126	123,555	135,724
Northwestern	135,469	135,913	110,124
Cent. West.	138,420	131,186	134,203
Southwest. .	66,716	66,096	70,491
Tot. West.			
Dist.	340,605	333,195	320,818
Tot. All Rds.	888,582	846,141	879,544
Commodities:			
Gr. & gr.			
prods.	52,462	55,258	48,382
Livestock ...	8,928	11,441	12,610
Coal	191,716	129,446	184,087
Coke	14,285	12,526	12,732
For. prods. .	49,627	46,044	48,700
Ore	82,145	82,328	58,510
Merch'e. l.c.l.	104,773	116,096	129,555
Misc.	384,646	392,402	384,132
June 26	888,582	846,141	879,544
June 19	906,774	901,296	858,423
June 12	906,948	895,292	867,918
June 5	821,213	900,747	830,128
May 29	904,848	830,205	620,885
Cumulative total, 26 weeks	20,767,200	21,669,597	19,015,862

In Canada. — Carloadings for the week ended June 26 totaled 79,020 cars as compared with 80,739 cars for the previous week and 79,065 cars for the corresponding week last year, according to the compilation of the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
June 26, 1948 ..	79,020	34,826
June 28, 1947 ..	79,065	38,331
Cumulative total for Canada:		
June 26, 1948 ..	1,916,844	913,170
June 27, 1947 ..	1,871,697	966,428

Truman Approves Many Bills Affecting Railroads

Approval last week by President Truman of S.J. Res.177, which provides for participation by the United States government in the Pan-American Railway Congress, was described by William T. Faricy, president of the Association of American Railroads, as "a step toward greater hemispheric solidarity and closer relations between the railroads of the two American continents."

President Truman also has signed numerous other bills of interest to the railroad industry, the details of which were described in the June 26 issue. They include S.2655, which, in addition to reestablishing selective service, authorizes the chief executive to require the steel industry to allocate steel to companies holding defense orders; and S.2192, which amends section 1 (7) of the Interstate Commerce Act so as to add railroad "time inspectors" to the list of those to whom railroads may give passes.

The President also has approved H.R.5524, making appropriations for the civil functions of the Department

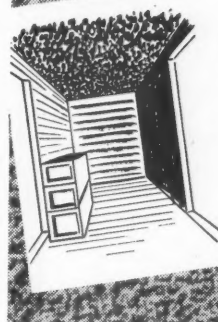
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of the Army, including \$166,989,100 for rivers and harbors work and \$405,741,100 for flood-control work; H.R. 5607, carrying funds for the Department of Commerce, including \$100,370,000 for the Civil Aeronautics Administration; and H.R. 6318, which amends the Standard Time Act as it relates to the boundary in Idaho between the Mountain and Pacific time zones.

Other legislation which has been approved by the President includes S. 2281, which provides for an air parcel-post service, and H.R. 5888, the federal-aid highway so-called postwar program for two additional fiscal years (those ending June 30, 1950, and June 30, 1951) at an annual rate of \$450,000,000.

Among other bills that have been signed by the President, were S. 1260, which provides for a three-member commission to pass upon claims against the government by midwestern motor carriers taken over during a wartime labor dispute and operated by the Office of Defense Transportation; H.R. 6419, the rivers and harbors flood-control measure, which authorizes 39 rivers and harbors projects on which the estimated cost of construction would be \$30,444,000 and the estimated annual maintenance would be \$790,100; H.R. 6916, which includes provisions increasing various postal rates while it raises the salaries of federal employees; H.R. 6829, the supplemental independent offices appropriation bill, which carries \$340,000 for O.D.T. operations from July 1 until February 28, 1949; and H.R. 6481, the government corporations appropriation bill, which carries \$2,000,000 for purchase by the Department of Commerce of additional stock of the government-owned Inland Waterways Corporation, operator of the Federal Barge Lines.

Canadian Roads and Unions Talk Wage Increase; Strike Date Near

Direct negotiations between the Canadian railways and a committee of 18 unions representing their employees were resumed last week, after the unions' spokesman, F. H. Hall, had informed the railroads that a strike would be effective July 15 unless a "satisfactory" agreement should be reached before then as to the union demands for a wage increase of 35 cents an hour. The railroads had indicated their willingness to resume negotiations directly, after a government conciliation board had made no progress in efforts to arrange a settlement, but in doing so the carriers emphasized that they had ac-

cepted the award of an earlier board of an increase of seven cents per hour, which the unions had rejected. This award, said the railroads, should be the "logical basis" for the last-minute negotiations.

Higher Loadings in Third Quarter Are Expected by Shippers Boards

Freight car loadings in the third quarter of 1948 are expected to be 3.7 per cent above those in the same period in 1947, according to estimates made by the 13 Shippers Advisory Boards.

On the basis of those estimates, freight car loadings of the 32 principal commodities will be 9,138,374 cars in the third quarter of 1948, compared with 8,814,081 actual car loadings for the same commodities in the corresponding period last year. All of the 13 boards, except the Southwest and the Trans-Missouri-Kansas regions, estimate an increase in car loadings for the third quarter of 1948 as compared with the same 1947 period.

The tabulation shows actual car loadings for each district in the third quarter of 1947, the estimated car loadings for the third quarter of 1948 and the percentage of increase or decrease.

The 13 boards expect an increase in the third quarter of 1948, compared with the same 1947 period, in the loading of 21 of the commodities listed, and a decrease in 11. Among those showing the greatest increase are the following: Vehicle parts, other than automobiles and trucks, 13.6 per cent; agricultural implements and vehicles, other than automobiles, 12.8 per cent; gravel, sand and stone, 10.1 per cent; lime and plaster, 7.5 per cent; machinery and boilers, 7.4 per cent; cement, 7.2 per cent; brick and clay products, 6.5 per cent; coal and coke, 6.2 per cent; iron and steel, 6 per cent; fertilizers of all kinds, 5.9 per cent; automobiles and trucks, 5.4 per cent; chemicals and explosives, 5.1 per cent; and paper, paperboard and prepared roofing, 4.1 per cent.

Commodities for which decreases are estimated, and the amount of the decrease, included the following: Fresh fruits, other than citrus fruits, 8 per cent; poultry and dairy products, 7.5 per cent; cottonseed, soy bean-vegetable cake and meal, excluding oil, 6.6 per cent; grain 6.2 per cent; livestock, 5.9 per cent; flour, meal and other mill products, 4.5 per cent; sugar syrup and molasses, 4.2 per cent; hay, straw and alfalfa, 2.6 per cent; and citrus fruits, 2.3 per cent.

Shippers Advisory Boards	Actual Loadings Third Quarter	Estimated Loadings Third Quarter	Per Cent Increase
	1947	1948	
New England	132,234	132,294	0.1
Atlantic States	916,592	934,352	1.9
Allegheny	1,135,761	1,212,144	6.7
Ohio Valley	1,023,185	1,061,031	3.7
Southeast	908,153	961,764	5.9
Great Lakes	689,866	748,052	8.4
Central Western	319,551	340,261	6.5
Mid-West	1,024,354	1,059,037	3.4
Northwest	841,385	848,737	0.9
Trans-Missouri-Kansas	519,094	492,305	5.2 Dec.
Southwest	627,430	618,966	1.3 Dec.
Pacific Coast	399,542	437,058	9.4
Pacific Northwest	276,934	292,373	5.6
TOTAL	8,814,081	9,138,374	3.7